

APPENDIX B.2

BIOLOGICAL RESOURCES INFORMATION

Appendix B.2

Special-Status Plant Species Descriptions

Heartscale (*Atriplex cordulata*) – CNPS 1B

Heartscale is included on the California Native Plant Society (CNPS) List 1B (CDFG 2008). It is an annual herb, in the family Chenopodiaceae, similar to *Atriplex coronata* var. *coronata*. Blooming from April to October (Tibor 2001), heartscale can be found in alkaline areas, often in association with scrublands and grasslands, chenopod scrub, meadows, seeps and valley and foothill grassland. This species is typically found in sandy, saline or alkaline soils, at elevations ranging 1 to 375 meters (CDFG 2008, CNPS 2008). Heartscale is predominately threatened by competition from non-native plants and trampling. It is known to exist in Alameda, Contra Costa, Butte, Fresno, Glenn, Kings, Kern, Madera, Merced, San Joaquin, Solano, Stanislaus, Tulare, and Yolo counties (CDFG 2008). Within the Project area heartscale has potential to occur in vernal wet alkaline areas, saltbush scrub and non-native grassland communities between MP 19.5 and 21.6. The nearest known population is adjacent to the Project area at the Alkali Sink Ecological Reserve.

Brittlescale (*Atriplex depressa*) –CNPS 1B

Brittlescale, an annual herb in the family Chenopodiaceae, is included on CNPS List 1B (CDFG 2008). This species blooms from May to October (Tibor 2001) and is often associated with vernal pools, meadows and seeps within scrub, annual grasslands, chenopod scrub, or playas. Brittlescale is found in alkaline or clay soils at elevations ranging from 1 to 320 meters (CDFG 2008, CNPS 2008). Grazing, tramping and development are the predominant threats to Brittlescale. Closely related to *Atriplex minuscula* and *Atriplex parishii* and can be found in Alameda, Butte, Contra Costa, Colusa, Fresno, Glenn, Kern, Madera, Merced, Solano, Stanislaus, Tulare, Yolo counties (CDFG 2008). Within the Project area Brittlescale has a potential to occur in vernal wet alkaline areas, saltbush scrub and non-native grassland communities between MP 19.5 and 21.6. The nearest known population is adjacent to the Project area at the Alkali Sink Ecological Reserve.

Lesser saltscale (*Atriplex minuscula*) - CNPS 1B

Lesser saltscale is an annual herb, in the family Chenopodiaceae, which blooms from May to October (Tibor 2001). The CNPS includes lesser saltscale on List 1B (CDFG 2008). Lesser saltscale is only found in slough systems, river floodplains and microhabitats that are inundated year-round, chenopod scrub, playas, valley and foothill grassland, alkaline, sandy soils and at elevations from 15 to 200 meters (CDFG 2008, CNPS 2008). Lesser saltscale is closely related to *Atriplex depressa* and *Atriplex parishii* and known from Butte, Fresno, Madera, Merced and Tulare counties (CDFG 2008). Within the Project area lesser saltscale could potentially occur in vernal wet alkaline areas, saltbush scrub and non-native grassland communities adjacent to the Fresno Slough. Lesser saltscale is known to exist in the Kerman Ecological Reserve, located approximately three miles from the Project area.

Vernal pool smallscale (*Atriplex persistens*) – CNPS 1B

Vernal pool smallscale is an annual herb in the family Chenopodiaceae, which blooms from June to October (Tibor 2001). The CNPS includes lesser saltscale on List 1B (CDFG 2008). Vernal pool smallscale habitat includes vernal pools and alkaline soil around elevations from 10 to 115 meters (CDFG 2008, CNPS 2008). Agriculture and flood control activities are potential threats to this species. Vernal pool smallscale is known to exist from Glenn, Madera, Merced, Solano, Stanislaus, and Tulare counties (CDFG 2008). Within the Project area this species could exist in vernal wet alkaline areas between MP 19.5 and 21.6.

Subtle orache (*Atriplex subtilis*) – CNPS 1B

Subtle orache is an annual herb in the Chenopodiaceae family, blooming from June to October (Tibor 2001). The CNPS includes subtle orache on List 1B (CDFG 2008). Subtle orache habitat includes non-native valley and foothill grassland communities, at elevations from 40 to 100 meters (CDFG 2008, CNPS 2008). Subtle orache is known to exist in Butte, Fresno, Kings, Kern,

Appendix B.2

Special-Status Plant Species Descriptions

Madera, Merced, and Tulare counties (CDFG 2008). Within the Project area this species has a potential to exist in non-native grassland communities between MP 19.5 and 21.6.

Lost Hills crownscale (*Atriplex vallicola*) - CNPS 1B

Lost Hills crownscale is an annual herb, in the family Chenopodiaceae, which blooms April to August (Tibor 2001). Lost Hills crownscale is included in CNPS list 1B (CDFG 2008). This species typically grows in dried beds of alkaline pools within scrub or annual grassland communities, chenopod scrub, valley and foothill grassland or vernal pools, at elevations between 50 and 635 meters (CDFG 2008, CNPS 2008). Potential threats to Lost Hills crownscale include grazing, agricultural conversion and energy development (CDFG 2008). Lost Hills crownscale is known to occur in the Kerman Ecological Reserve located approximately three miles from the Project area as well as other areas of Fresno, Kings, Kern, Merced, and San Luis Obispo counties. Within the Project area this species has a potential to occur in vernal wet alkaline areas, saltbush scrub and non-native grassland communities between MP 19.5 and 21.6.

California jewel-flower (*Caulanthus californicus*) – FE, CE, CNPS 1B

California Jewel-flower is an annual herb, in the Brassicaceae family, blooming February to May (Tibor 2001). This species is listed as a federally endangered (FE) as well as a California endangered (CE) species. Additionally, the CNPS lists the California jewel-flower as a 1B species (CDFG 2008). The California jewel-flower resides in sandy soil found in chenopod scrub, valley and foothill grassland and pinyon-juniper woodland at elevations from 65 to 1000 meters (CDFG 2008, CNPS 2008). Potential threats to this species include agriculture, urbanization, energy development, and grazing, and possibly by non-native plants. Within the Project area the California jewel-flower has the potential to occur in saltbush scrub and non-native grassland communities.

Hispid bird's-beak (*Cordylanthus mollis* ssp. *hispidus*) – CNPS 1B

Hispid bird's-beak is a hemi-parasitic annual herb, in the Scrophulariaceae family, which blooms June to September (Tibor 2001). The CNPS lists hispid bird's-beak as a 1B species (CDFG 2008). Habitat conditions include damp alkaline soils in meadows, playas, valley and foothill grasslands, and alkaline sinks with *Distichlis* at elevations ranging from 10 to 155 meters (CDFG 2008, CNPS 2008). In the Project area hispid bird's-beak has a potential to occur in vernal wet alkaline areas, saltbush scrub and non-native grassland communities between MP 19.5 and 21.6.

Palmate-bracted birds-beak (*Cordylanthus palmatus*) FE, CE, CNPS 1B

Palmate-bracted birds-beak is a FE, SE and CNPS 1B listed species (CDFG 2008). Species is a hemiparasitic annual herb, in the family Scrophulariaceae, blooming from May to October (Tibor 2001). This species' habitat includes chenopod scrub, valley grasslands and foothill grassland with alkaline soils at elevations ranging from 5 to 155 meters (CDFG 2008, CNPS 2008). Palmate-bracted birds-beak is restricted to seasonally-flooded, saline-alkali soils in lowland plains and basins, primarily along the edges of channels and drainages with the potential to occur in vernal wet alkaline areas, saltbush scrub and non-native grassland communities. Species is known to exist in the Kerman Ecological Reserve, located approximately 3 miles from the Project area, the Alkali Sink Ecological Reserve, immediately adjacent to the Project area, as well as Alameda, Colusa, Fresno, Madera, San Joaquin and Yolo counties (CDFG 2008). Palmate-bracted birds-beak is threatened by agriculture, urbanization, vehicles, altered hydrology, grazing, and industrial development. In the Project area it has a potential to exist in vernal wet alkaline areas, saltbush scrub and non-native grassland communities between MP 19.5 and 21.6. The nearest known population is adjacent to the Project area at the Alkali Sink Ecological Reserve.

Recurved larkspur (*Delphinium recurvatum*) – CNPS 1B

Recurved larkspur is a perennial herb, in the family Ranunculaceae, which blooms March to May (June) (Tibor 2001). The CNPS includes this species on list 1B (CDFG 2008). Recurved larkspur resides in areas with alkaline soils in chenopod or valley saltbush scrub, cismontane

Appendix B.2

Special-Status Plant Species Descriptions

woodland and valley or foothill grassland at elevations from 3 to 750 meters (CDFG 2008, CNPS 2008). Potential threats to the recurved larkspur include agricultural habitat conversion, grazing and trampling. This species has been identified in Alameda, Butte, Contra Costa, Colusa, Fresno, Kings, Kern, Madera, Merced, Monterey, San Luis Obispo, Solano, and Tulare counties (CDFG 2008). Within the Project area Recurved larkspur has the potential to exist in vernal wet alkaline areas with saltbush scrub and non-native grassland communities.

Hoover's eriastrum (*Eriastrum hooveri*) – FD, CNPS 4

Hoover's eriastrum is an annual herb, in the family Polemoniaceae, which blooms March to July (Tibor 2001). Hoover's eriastrum was federally delisted (FD) in October 2003 but is still listed by CNPS as a List 4 species (CDFG 2008). Habitats include chenopod scrub, pinyon and juniper woodland, valley and foothill grassland, as well as sparsely vegetated alkaline alluvial fans. Hoover's eriastrum is often found with saltbush, goldfields, and annual grasses in areas where there is a sparse covering of annual grasses in sandy soils at elevations from 50 to 915 meters (CDFG 2008, CNPS 2008). Potential threats to this species include agriculture, grazing, urbanization, energy development, and vehicles. Hoover's eriastrum is known to exist in Fresno, Kings, Kern, Santa Barbara, San Benito San Luis Obispo and Tulare counties (CDFG 2008) and recorded occurrences have been noted the Alkali Sink Ecological Reserve, immediately adjacent to the Project area. Within the Project area Hoover's eriastrum has the potential to occur in vernal wet alkaline areas, saltbush scrub and non-native grassland communities between MP 19.5 and 21.6. The nearest known population is adjacent to the Project area at the Alkali Sink Ecological Reserve.

Temblor buckwheat (*Eriogonum temblorense*) –CNPS 1B

Temblor buckwheat is an annual herb in the Polygonaceae family and blooms from May to September (Tibor 2001). The CNPS includes temblor buckwheat on List 1B (CDFG 2008). This species is predominately found in the valley and foothill grasslands, barren clay or sandstone substrates at elevations ranging from 300 to 1000 meters (CDFG 2008, CNPS 2008). Temblor buckwheat is marginally distinct from *E. eatwoodianum* and is threatened by energy development (CDFG 2008). Within the Project area temblor buckwheat has a low potential to occur in non-native grassland communities.

Munz's tidy-tips (*Layia munzii*) – CNPS 1B

Munz's tidy-tips is an annual herb in the Asteraceae family, with a blooming period from March to April (Tibor 2001). The CNPS lists Munz's tidy-tips as a 1B species (CDFG 2008). This species grows in alkaline clays found in low-lying scrublands and on hillside grasslands at elevations ranging from 45 to 760 meters (CDFG 2008, CNPS 2008). Munz's tidy-tips is similar to *L. jonesii* and *L. leucopappa* and is known from Fresno, Kern, and San Luis Obispo counties (CDFG 2008) as well as around the area of Firebaugh and Mendota. The nearest recorded population to the Project area is near the intersection of Lincoln and Highway 33. Within the Project area Munz's tidy-tips potentially grows in vernal wet alkaline areas, saltbush scrub and non-native grassland communities.

Panoche pepper-grass (*Lepidium jaredii* ssp. *album*) - CNPS 1B

Panoche pepper-grass is an annual herb in the Brassicaceae family, blooming from February to June (Tibor 2001). The CNPS lists Panoche pepper-grass as a 1B species (CDFG 2008). Habitats include clay and gypsum rich soils in valley and foothill grassland, alluvial fans and washes with alkali bottoms at elevations between 65 and 910 meters (CDFG 2008, CNPS 2008). Panoche pepper-grass is threatened by gravel mining and cattle grazing. This species is known to exist around Panoche Creek, south of Mendota as well as Fresno, San Benito, and San Luis Obispo counties (CDFG 2008). Within the Project area, Panoche pepper-grass has the potential to exist in vernal wet alkaline areas, saltbush scrub and non-native grassland communities.

Appendix B.2

Special-Status Plant Species Descriptions

Jared's pepper-grass (*Lepidium jaredii* ssp. *jaredii*) - CNPS 1B

Jared's pepper-grass is an annual herb, in the family Brassicaceae, with a blooming period from March to May (Tibor 2001). Jared's pepper-grass is a CNPS 1B listed species (CDFG 2008). This species is predominately found in the valley and foothill grassland, alkali flats and sinks, occasionally alkaline adobe soils at elevations ranging from 335 to 1005 meters (CDFG 2008, CNPS 2008). Jared's pepper-grass is only known to occur near Soda Lake on the Cariozo Plain (San Luis Obispo County) and Devil's Den (Kern County) (CDFG 2008). Within the Project area Jared's pepper-grass has a potential to exist in vernal wet alkaline areas, saltbush scrub and non-native grassland communities.

Showy madia (*Madia radiata*) – CNPS 1B

Showy madia is an annual herb in the family Asteraceae, which blooms from March to May (Tibor 2001). The CNPS lists showy madia as a 1B species (CDFG 2008). Showy madia is predominately found in areas of adobe clay within cismontane woodlands, valley and foothill grasslands and chenopod scrub at elevations ranging from 25 to 1125 meters (CDFG 2008, CNPS 2008). Potential threats to this species include grazing animals and non-native plants. Recorded occurrences are scattered, but showy madia is known to exist in Contra Costa, Fresno, Kings, Kern, Monterey, Santa Barbara, San Benito, San Joaquin, San Luis Obispo, and Stanislaus counties (CDFG 2008). Within the Project area showy madia potentially occurs in vernal wet alkaline areas, saltbush scrub and non-native grassland communities.

San Joaquin woollythreads (*Monolopia (Lembertia) congdonii*) FE, CNPS 1B

San Joaquin woollythreads is an annual herb in the family Asteraceae and is listed as FE and appears on the CNPS 1B species list (CDFG 2008). This species is federally listed as *Lembertia congdonii*. San Joaquin woollythreads bloom from February to May and are found predominately in chenopod scrub, valley and foothill grassland, sandy soil and alkali sinks at elevations ranging from 60 to 800 meters (CDFG 2008, CNPS 2008). This species is extremely threatened by agricultural conversion, energy development, urbanization, grazing, trampling, and vehicles. San Joaquin woollythreads are known to exist in Fresno, Kings, Kern, Santa Barbara, San Benito, San Luis Obispo, and Tulare counties and approximately half of historical occurrences have been extirpated. Within the Project area it is very unlikely for San Joaquin woollythreads to occur in vernal wet alkaline areas, saltbush scrub and non-native grassland communities, based on current extant populations.

Sanford's arrowhead (*Sagittaria sanfordii*) – CNPS 1B

Sanford's arrowhead is a perennial herb (rhizomatous, emergent) in the family Alismataceae, with a blooming period from May to October (Tibor 2001). This is a CNPS 1B listed species (CDFG 2008). Habitats for Sanford's arrowhead include: marshes and swamps, standing or slow moving freshwater ponds and ditches at elevations between 0 to 610 meters (CDFG 2008, CNPS 2008). Sanford's arrowhead is potentially threatened by grazing, development, recreational activities, non-native plants, road widening, and channel alteration. This species has mostly been extirpated from southern California and the Central Valley, however it is known to occur in Butte, Del Norte, El Dorado, Fresno, Merced, Mariposa, Orange, Placer, Sacramento, Shasta, San Joaquin, Tehama, Ventura counties (CDFG 2008). Within the Project area Sanford's arrowhead has a low potential to occur in degraded wetland areas adjacent to the Fresno Slough.

REFERENCES

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Appendix B.2

Special-Status Plant Species Descriptions

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Appendix B.2

Table B.2-1. Special Status Plant Species Identified During the Literature Search

Common and Scientific Name	Status	Life Form	Blooming Periods	Habitat Conditions	Potential to Occur in the Project Area
Heartscale <i>Atriplex cordulata</i>	CNPS 1B	annual herb	Apr – Oct	Grows in alkaline areas, often in association with scrublands and grasslands. Chenopod scrub, meadows, seeps and valley and foothill grassland. Sandy, saline or alkaline soils; elevation 1-375 meters.	Potential to occur in vernal wet alkaline areas, saltbush scrub and non-native grassland communities.
Brittlescale <i>Atriplex depressa</i>	CNPS 1B	annual herb	May – Oct	Grows on alkaline clay, often in association with vernal pools or within scrub or annual grasslands. Chenopod scrub, meadows and seeps, playas, valley and foothill grassland, and vernal pools. Alkaline or clay soils; elevation 1-320 meters.	Potential to occur in vernal wet alkaline areas, saltbush scrub and non-native grassland communities.
Lesser saltscale <i>Atriplex minuscula</i>	CNPS 1B	annual herb	May – Oct	Grows on sandy soils in alkaline areas, often in association with slough systems and river floodplains. Only found in microhabitats that are inundated year-round. Chenopod scrub, playas, valley and foothill grassland, alkaline, sandy soil; elevation 15-200 meters.	Potential to occur in vernal wet alkaline areas, saltbush scrub and non-native grassland communities adjacent to the Fresno Slough. Known from Kerman Ecological Reserve located approximately 3 miles from the Project area.
Vernal pool smallscale <i>Atriplex persistens</i>	CNPS 1B	annual herb	Jun - Oct	Vernal pools, alkaline soil; elevation 10-115 meters.	Potential to occur in vernal wet alkaline areas.
Subtle orache <i>Atriplex subtilis</i>	CNPS 1B	annual herb	Jun - Aug (Oct)	Valley and foothill grassland; elevation 40-100 meters.	Potential to occur in non-native grassland communities.
Lost Hills crownscale <i>Atriplex vallicola</i>	CNPS 1B	annual herb	Apr – Aug	Typically grows in the dried beds of alkaline pools within scrub or annual grassland communities. Chenopod scrub, valley and foothill grassland and vernal pools. Alkaline soils; elevation 50-635 meters.	Potential to occur in vernal wet alkaline areas, saltbush scrub and non-native grassland communities. Known from Kerman Ecological Reserve located approximately 3 miles from the Project area.
California jewel-flower <i>Caulanthus californicus</i>	FE, SE, CNPS 1B	annual herb	Feb – May	Chenopod scrub, valley and foothill grassland, and pinyon-juniper woodland. Sandy soil; elevation 65-1000 meters.	Potential to occur in saltbush scrub and non-native grassland communities

Appendix B.2

Table B.2-1. Special Status Plant Species Identified During the Literature Search

Common and Scientific Name	Status	Life Form	Blooming Periods	Habitat Conditions	Potential to Occur in the Project Area
Hispid bird's-beak <i>Cordylanthus mollis</i> ssp. <i>hispidus</i>	CNPS 1B	annual herb (hemiparasitic)	June – Sept	Meadows, playas, valley and foothill grassland, damp alkaline soils, especially in alkaline meadows and alkaline sinks with <i>Distichlis</i> ; elevation 10-155 meters.	Potential to occur in vernal wet alkaline areas, saltbush scrub and non-native grassland communities
Palmate-bracted birds-beak <i>Cordylanthus palmatus</i>	FE, SE, CNPS 1B	annual herb (hemiparasitic)	May – Oct	Chenopod scrub and valley and foothill grassland with alkaline soils. Restricted to seasonally-flooded, saline-alkali soils in lowland plains and basins, primarily along the edges of channels and drainages; elevation 5-155 meters.	Potential to occur in vernal wet alkaline areas, saltbush scrub and non-native grassland communities. Known from Kerman Ecological Reserve located approximately 3 miles from the Project area as well as the Alkali Sink Ecological Reserve immediately adjacent to the Project area.
Recurved larkspur <i>Delphinium recurvatum</i>	CNPS 1B	perennial herb	Mar - May (June)	Chenopod or valley saltbush scrub, cismontane woodland, and valley and foothill grassland. Alkaline soil; elevation 3-750 meters.	Potential to occur in vernal wet alkaline areas, saltbush scrub and non-native grassland communities
Hoover's eriastrum <i>Eriastrum hooveri</i>	FD (10/03), CNPS 4	annual herb	Mar – Jul	Chenopod scrub, pinyon and juniper woodland, valley and foothill grassland, and sparsely vegetated alkaline alluvial fans. Found with saltbush, goldfields, and annual grasses in areas where there is a sparse covering of annual grasses. Sandy soils elevation 50-915 meters.	Potential to occur in vernal wet alkaline areas, saltbush scrub and non-native grassland communities. Known from the Alkali Sink Ecological Reserve immediately adjacent to the Project area.
Temblor buckwheat <i>Eriogonum temblorense</i>	CNPS 1B	annual herb	May – Sept	Valley and foothill grassland, barren clay or sandstone substrates; elevation 300-1000 meters.	Low potential to occur in non-native grassland communities.
Munz's tidy-tips <i>Layia munzii</i>	CNPS 1B	annual herb	Mar – Apr	Chenopod scrub, valley and foothill grassland on alkaline clay soils. Grows on alkaline clay in low-lying scrublands and on hillsides in grasslands; elevation 45-760 meters.	Potential to occur in vernal wet alkaline areas, saltbush scrub and non-native grassland communities. Historically known from the Firebaugh and Mendoata area.

Appendix B.2

Table B.2-1. Special Status Plant Species Identified During the Literature Search

Common and Scientific Name	Status	Life Form	Blooming Periods	Habitat Conditions	Potential to Occur in the Project Area
Panoche pepper-grass <i>Lepidium jaredii</i> ssp. <i>album</i>	CNPS 1B	annual herb	Feb – Jun	Valley and foothill grassland, alluvial fans and washes, and alkali bottoms, on clay and gypsum rich soils; elevation 65-910 meters.	Potential to occur in vernal wet alkaline areas, saltbush scrub and non-native grassland communities. Extant population known from Panoche Creek, south of Mendota.
Jared's pepper-grass <i>Lepidium jaredii</i> ssp. <i>jaredii</i>	CNPS 1B	annual herb	Mar – May	Valley and foothill grassland, alkali flats and sinks, occasionally alkaline adobe soils; elevation 335-1005 meters.	Potential to occur in vernal wet alkaline areas, saltbush scrub and non-native grassland communities.
Showy madia <i>Madia radiata</i>	CNPS 1B	annual herb	Mar – May	Cismontane woodland, valley and foothill grassland, chenopod scrub, adobe clay; elevation 25-1125 meters.	Potential to occur in vernal wet alkaline areas, saltbush scrub and non-native grassland communities.
San Joaquin woollythreads <i>Monolopia (Lembertia) congdonii</i>	FE, CNPS 1B	annual herb	Feb – May	Chenopod scrub, valley and foothill grassland, sandy soil, alkali sinks; elevation 60-800 meters.	Low potential to occur in vernal wet alkaline areas, saltbush scrub and non-native grassland communities. Very unlikely based on current extant populations.
Sanford's arrowhead <i>Sagittaria sanfordii</i>	CNPS 1B	perennial herb (rhizomatous, emergent)	May- Oct	A freshwater marsh species which occurs in small ponds and sluggish waters of creeks, ditches and canals. Marshes and swamps, standing or slow moving freshwater ponds and ditches; elevation 0-610 meters.	Low potential to occur in degraded wetland areas adjacent to the Fresno Slough.
Chaparral ragwort, rayless ragwort <i>Senecio aphanactis</i>	CNPS 2	annual herb	Jan – Apr	Chaparral, cismontane woodland, coastal scrub, alkaline soils; elevation 15-800 meters.	No potential to occur based on lack of appropriate habitat within the Project area and location of extant populations. Not discussed further.

Sources: California Natural Diversity Database (CDFG 2008a), CNPS Inventory of Rare and Endangered Vascular Plants (Tibor 2001), San Joaquin Valley Upland Species Recovery Plan (USFWS 1998)

Status Codes:

FE: Federally Endangered
FT: Federally listed as Threatened

Appendix B.2

Table B.2-1. Special Status Plant Species Identified During the Literature Search

- CE: State of California Endangered
- CT: State of California Threatened
- CR: State of California Rare
- CNPS - California Native Plants Society
 - 1A - Presumed Extinct in California.
 - 1B - Rare, Threatened, or Endangered in California and elsewhere.
 - 2 - Rare, Threatened, or Endangered in California, but more common elsewhere
 - 3 - Plants about which we need more information - a review list
 - 4 - Plants of Limited Distribution – a watch list
- Not listed

Appendix B.2
Special-Status Wildlife Species Descriptions

INVERTEBRATES

Vernal Pool Fairy Shrimp (*Branchinecta lynchi*) - FT

STATUS Vernal pool fairy shrimp is a Federally Threatened Species (CDFG 2008).

DISTRIBUTION The vernal pool fairy shrimp was given full species status relatively recently, in 1990, and there is little information on the historical range of the species. However, the vernal pool fairy shrimp is currently known to occur in a wide range of vernal pool habitats in the southern and Central Valley areas of California, and in two vernal pool habitats in Oregon. Known extant populations are known in central Fresno County, east of Hwy 99 (USFWS 2005).

HABITAT Vernal pool fairy shrimp exist only in vernal pools or vernal pool-like habitats. Individuals have never been found in riverine, marine, or other permanent bodies of water. Vernal pool habitats form in depressions above an impervious soil layer or duripan. Due to local topography and geology, the depressions are part of an undulating landscape, where soil mounds are interspersed with basins, swales, and drainages. Water movement within complexes allows vernal pool fairy shrimp to move between individual pools (USFWS 2005).

The vernal pool fairy shrimp occupies a variety of different vernal pool habitats, from small, clear, sandstone rock pools to large, turbid, alkaline, grassland valley floor pools. They tend to be found in smaller pools (USFWS 2005).

LIFE HISTORY Vernal pool fairy shrimp are highly adapted to the environmental conditions of their ephemeral habitats. One adaptation is the ability of the vernal pool fairy shrimp eggs, or cysts, to remain dormant in the soil when their vernal pool habitats are dry. Another important adaptation is that the vernal pool fairy shrimp has a relatively short life span, allowing it to hatch, mature to adulthood, and reproduce during the short time period when vernal pools contain water. The vernal pool fairy shrimp can reach sexual maturity in as few as 18 days at optimal conditions of 20 ° Celsius (C) (68 ° Fahrenheit (F)), and can complete its life cycle in as little as 9 weeks. Maturation and reproduction rates of vernal pool crustaceans are controlled by water temperature and can vary greatly. In larger pools that hold water for longer durations, vernal pool fairy shrimp are capable of hatching multiple times if water temperatures drop to below 10 ° C (50 ° F), a necessary environmental cue for vernal pool fairy shrimp cyst hatching. Vernal pool fairy shrimp have been observed living for as long as 147 days (USFWS 2005).

Vernal pool fairy shrimp feed on algae, bacteria, protozoa, rotifers, and bits of detritus (USFWS 2005).

POTENTIAL TO OCCUR This species is unlikely to occur within the Project vicinity. No known populations have been documented within the Project area and suitable habitat has been observed between MP 19.5 and 21.6 of the Proposed route (Pers. Comm. Wolf 2008).

Vernal Pool Tadpole Shrimp (*Lepidurus packardii*) - FE

STATUS Vernal pool tadpole shrimp is a Federally Endangered Species (CDFG 2008).

DISTRIBUTION The vernal pool tadpole shrimp is currently distributed across the Central Valley of California and in the San Francisco Bay area. In the Southern Sierra Foothills region, the species occurs at the Stone Corral Ecological Preserve in Tulare County, on ranchlands in eastern Merced County, at the Big Table Mountain Preserve in Fresno County, and at a few locations in Stanislaus County (USFWS 2005).

HABITAT Vernal pool tadpole shrimp occur in a wide variety of ephemeral wetland habitats. The species has been collected in vernal pools ranging from 2 to 356,253 square meters (sq m) (6.5 square feet (sq ft) to 88 acres) in surface area. Some of these vernal pools may be too small to

Appendix B.2

Special-Status Wildlife Species Descriptions

remain inundated for the entire life cycle of the tadpole shrimp, but the vernal pool tadpole shrimp may be able tolerate temporary drying conditions. Vernal pool tadpole shrimp have been found in pools with water temperatures ranging from 10 ° C (50 ° F) to 29 ° C (84 ° F) and pH ranging from 6.2 to 8.5. However, vernal pools exhibit daily and seasonal fluctuations in pH, temperature, dissolved oxygen, and other water chemistry characteristics. Determining the vernal pool tadpole shrimp's habitat requirements is not possible based on anecdotal evidence, and the tolerances of this species to specific environmental conditions have yet to be determined (USFWS 2005).

LIFE HISTORY although the vernal pool tadpole shrimp is adapted to survive in seasonally available habitat, the species has a relatively long life span compared to other vernal pool crustaceans. Vernal pool tadpole shrimp continue growing throughout their lives, periodically molting their shells. It has been found that vernal pool tadpole shrimp took a minimum of 25 days to mature and the mean age at first reproduction was 54 days. Other researchers have observed that vernal pool tadpole shrimp generally take between 3 and 4 weeks to mature. Variation in growth and maturation rates may be a result of differences in water temperature, which strongly influences the growth rates of aquatic invertebrates (USFWS 2005).

Vernal pool tadpole shrimp have relatively high reproductive rates, laying up to 6 clutches per season. After winter rains fill their vernal pool habitats, dormant vernal pool tadpole shrimp cysts may hatch in as little as four days. Multiple hatching within the same wet season allows vernal pool tadpole shrimp to persist within vernal pools as long as these habitats remain inundated, sometimes for six months or more (USFWS 2005)

POTENTIAL TO OCCUR This species is unlikely to occur. No known populations have been documented within the Project vicinity and suitable habitat has been observed between MP 19.5 and 21.6 of the Proposed route (Pers. Comm. Wolf 2008).

Valley Elderberry Longhorn Beetle (*Desmocerus californicus dimorphus*) - FT

STATUS Valley elderberry longhorn beetle is a Federally Threatened Species (CDFG 2008).

DISTRIBUTION This species is endemic to California. They are found from southern Shasta County south to Fresno County in the San Joaquin Valley. They are considered extirpated from their historical range further south (USFWS 2006).

HABITAT This beetle is only found in riparian areas along rivers and streams in association with its host plant, elderberry (*Sambucus* sp). Valley elderberry longhorn beetle is not known to occur in riparian habitats that lack elderberry bushes (USFWS 2006).

LIFE HISTORY Adult beetles are present on the host plant and are present from March to June, feeding on the foliage and possibly flowers, when they also mate and females lay eggs onto the elderberry plants. The first instar larvae bore into the plant and spend one or two years feeding on pith. Prior to forming their pupae, they chew through the bark and plug the hole with wood shavings. They will then crawl back into the chamber to undergo pupation where they will emerge as adults in spring (USFWS 2006).

POTENTIAL TO OCCUR This species may potentially occur. Some suitable riparian habitat exists within the Project area and vicinity, and several elderberry (*Sambucus* sp.) shrubs have been documented growing within the Project area.

FISH

Delta Smelt (*Hypomesus transpacificus*) - FT/ST

STATUS Delta smelt is listed as a federally threatened species and as a threatened species by the State of California (CDFG 2008).

Appendix B.2

Special-Status Wildlife Species Descriptions

DISTRIBUTION Delta smelt are endemic to California. Delta smelt are endemic to the upper Sacramento-San Joaquin estuary. They occur in the Delta primarily below Isleton on the Sacramento River, below Mossdale on the San Joaquin River, and in Suisun Bay. They move into freshwater when spawning (ranging from January to July) and can occur in: (1) the Sacramento River as high as Sacramento, (2) the Mokelumne River system, (3) the Cache Slough region, (4) the Delta, and, (5) the Montezuma Slough area of the estuary. Since 1982, the center of delta smelt abundance has been the northwestern Delta in the channel of the Sacramento River. However, they have since recolonized Suisun Bay (USFWS 1995).

HABITAT Delta smelt are euryhaline (a species that tolerates a wide range of salinities) fish that rarely occur in water with more than 10-12 parts per thousand (ppt) salinity (about 1/3 sea water). In recent history, they have been most abundant in shallow areas where early spring salinities are around 2 ppt. However, prior to the 1800's before the construction of levees that created the Delta Islands, a vast fluvial marsh existed in the Delta and the delta smelt probably reared in these upstream areas (USFWS 1995).

Spawning can take place over the entire 7-22 ° C (44-72 ° F) range. Temperatures that are optimal for survival of embryos and larvae have not yet been determined, although low hatching success and embryo survival from spawns of captive fish collected at higher temperatures has been found. Delta smelt of all sizes are found in the main channels of the Delta and Suisun Marsh and the open waters of Suisun Bay where the waters are well oxygenated and temperatures relatively cool, usually less than 20-22 ° C (68-72 ° F) in summer. When not spawning, they tend to be concentrated near the zone where incoming salt water and out flowing freshwater mix (mixing zone) (USFWS 1995).

LIFE HISTORY Delta smelt inhabit open, surface waters of the Delta and Suisun Bay, where they presumably school. Spawning takes place between January and July, as inferred from larvae collected during this period. Timing and length of the spawning season may vary. Spawning usually takes place from late March through mid-May in low outflow years (USFWS 1995).

Laboratory observations have indicated that delta smelt are broadcast spawners and eggs are demersal (sinks to the bottom) and adhesive, sticking to hard substrates such as: rock, gravel, tree roots or submerged branches, and submerged vegetation. At 14-16 ° C (57-61 ° F), embryonic development to hatching takes 9 -14 days and feeding begins 4-5 days later. Newly hatched delta smelt maintain themselves just off the bottom, where they feed on rotifers (microscopic crustaceans used by fish for food) and other microscopic prey. Once the swimbladder develops, larvae become more buoyant and rise up higher into the water column. At this stage most are presumably washed downstream until they reach the mixing zone or the area immediately upstream of it (USFWS 1995).

Delta smelt feed primarily on planktonic copepods, cladocerans, amphipods and on insect larvae. Larger fish may also feed on the opossum shrimp, *Neomysis mercedis*. The most important food organism for all sizes seems to be the euryhaline copepod, *Eurytemora affinis*, although in recent years the exotic species, *Pseudodiaptomus forbesi*, has become a major part of the diet (USFWS 1995).

POTENTIAL TO OCCUR It is unlikely delta smelt would occur in the Project area. Although they do occur in the San Joaquin River, they have never been known to occur as far upstream as the Project area, primarily being found downstream of Mossdale. Waterways within the Project area are freshwater and do not provide the brackish water conditions this species prefers. The San Joaquin River is often dry, which eliminates habitat for this species as well. The Mendota Dam, located at the outflow of the Mendota Pool within the Project vicinity, is a barrier to fish passage, although it is not known if fish populations upstream and downstream from the dam are completely isolated from one another.

Appendix B.2

Special-Status Wildlife Species Descriptions

Longfin Smelt (*Spirinchus thaleichthys*) - SC

STATUS This species is a Species of Special Concern in California (CDFG 2008). Petitions have been filed to list the longfin smelt under the California Endangered Species Act (The Bay Institute et al. 2007).

DISTRIBUTION The longfin smelt is an estuarine-anadromous fish native to the Pacific Coast of North America. The species occurs in scattered populations along the coast from the San Francisco Bay-Delta Estuary to Prince William Sound, Alaska, as well as landlocked populations in Washington and British Columbia. Other populations of longfin smelt in California have been recorded in Humboldt Bay, and the estuaries of the Russian, Eel, and Klamath Rivers (The Bay Institute et al. 2007).

The distribution and range of the San Francisco Bay-Delta Estuary longfin smelt population extends from Rio Vista (on the Sacramento River in the Delta) and Medford Island (on the San Joaquin River in the Delta) through Suisun Bay and Suisun Marsh, San Pablo Bay, San Francisco Bay, and the South Bay, and into the Gulf of the Farallones, just outside of the Golden Gate (The Bay Institute et al. 2007).

HABITAT Longfin smelt are a pelagic (i.e., they live in open waters), estuarine-anadromous species. They tolerate a wide range of salinities (i.e., they are euryhaline) and are capable of living in fresh, brackish and marine waters. Most of their life cycle is completed in brackish to marine waters, with most post-larval fish in the San Francisco Bay-Delta population found in salinities from 15-30 psu (practical salinity units), although nearshore marine habitats are also used. Based on the locations where gravid adults are captured, spawning probably occurs in fresh to slightly brackish waters (The Bay Institute et al. 2007).

Longfin smelt migrate throughout the Bay-Delta Estuary over the course of their life cycle usually keeping in waters below 20°C. The species is found in open waters throughout the estuary and in the larger channels and sloughs of Suisun Marsh. During fall and winter months, longfin smelt numbers are greatest in the northern Estuary (particularly Suisun Bay and the western Delta) although they are also found in shallow bays such as San Pablo Bay and the South Bay at that time. During summer months, higher densities of longfin smelt are found in the Central Bay (The Bay Institute et al. 2007).

LIFE HISTORY Longfin smelt have a two-year life cycle, although a small fraction of individuals may spawn as one- or three-year old fish. Spawning in the San Francisco Bay-Delta Estuary takes place in fresh or slightly brackish water over sandy or gravel substrates and at temperatures ranging from 7 to 14.5 °C. Spawning at lower temperatures has been observed in other populations. Exact locations and environmental conditions of spawning sites are currently unknown but, based on their behavior in other water bodies, it is likely that longfin smelt in the San Francisco Bay-Delta Estuary deposit their eggs on cobble or plant substrates at the bottom of deep channel habitats.

Based on their distribution patterns during the spawning season, the main spawning area for the San Francisco Bay-Delta Estuary longfin smelt population appears to be downstream of Rio Vista on the Sacramento River. Spawning probably also occurs in the eastern portion of Suisun Bay and, in some years, the larger sloughs of Suisun Marsh. Historically, spawning probably also occurred in the San Joaquin River, but recent catches of longfin smelt in the San Joaquin River have been extremely low (The Bay Institute et al. 2007).

The longfin smelt spawning season is protracted and timing varies somewhat from year to year. Most spawning occurs between January and March. Embryos hatch in 40 days at 7 °C. In the San Francisco Bay-Delta Estuary, larvae are frequently caught upstream of the Sacramento-San Joaquin River confluence in the Delta and then become widely dispersed throughout the upper

Appendix B.2

Special-Status Wildlife Species Descriptions

Estuary, with the volume of freshwater outflow to the Estuary having a significant effect on the breadth of their final distribution (The Bay Institute et al. 2007).

In the San Francisco Bay-Delta Estuary, the principal prey items for adult longfin smelt are believed to be opossum shrimp, *Acanthomysis* sp. and *Neomysis mercedis*; although populations of the latter species have dropped dramatically in recent years in the Estuary. Copepods and other crustaceans are also important prey, especially for smaller fish (The Bay Institute et al. 2007).

POTENTIAL TO OCCUR It is unlikely longfin smelt would occur in the Project vicinity. Although they do occur in the San Joaquin River, they have never been known to occur as far upstream as the Project vicinity. They are rarely recorded upstream of Medford Island, in the Sacramento-San Joaquin Delta. In the Project area, the San Joaquin River is often dry, which eliminates essential habitat for this species as well. Fresno Slough holds water year round, however the area does not provide brackish or saltwater conditions that both juveniles and adults are typically found in. The Mendota Dam, located at the outflow of the Mendota Pool within the Project vicinity, is a barrier to fish passage, although it is not known if fish populations upstream and downstream from the dam are completely isolated from one another.

Sacramento Splittail (*Pogonichthys macrolepidotus*) - FD/SC

STATUS Sacramento splittail is a Species of Special Concern in California (CDFG 2008). It was formerly considered a federally threatened species but was delisted in 2003 (USFWS 2008a).

DISTRIBUTION Sacramento splittail are found only in California's Central Valley where they were once widely distributed in lakes and rivers. Historically, splittail were found as far north as Redding on the Sacramento River and as far south as the Friant Dam on the San Joaquin River. Splittail were common in San Pablo Bay and Carquinez Strait following high winter flows until about 1985. They are now largely confined to the Sacramento – San Joaquin River Delta, Suisun Bay, Suisun Marsh, Napa River, Petaluma River, and other parts of the Sacramento-San Joaquin Estuary (USFWS 2008a).

Recent surveys of San Joaquin Valley streams found small numbers of splittail in the San Joaquin River below its confluence with the Merced River; large numbers of juveniles were caught in 1986 in the San Joaquin River 10-12 kilometers (Km) (6-7 miles) above the junction with Tuolumne River (USFWS 1995).

HABITAT Splittail are primarily freshwater fish, but are tolerant of moderate salinity (saltiness) and can live in water with salinities of 10-18 ppt. In the 1950s, they were commonly caught by striped bass anglers in Suisun Bay. During the past 20 years, however, they have been found mostly in slow-moving sections of rivers and in sloughs and have been most abundant in the Suisun Bay and Marsh region (USFWS 2008a).

Splittail spawn on submerged vegetation in temporarily flooded upland and riparian habitat. Typically, terrestrial shrubs and herbs are preferred over emergent wetland vegetation such as cattails and tules. Spawning occurs in the lower reaches of rivers, bypasses used for flood management, dead-end sloughs and in the larger sloughs such as Montezuma Slough. Larvae remain in the shallow, weedy areas inshore near the spawning sites and move into the deeper offshore habitat as they mature (USFWS 2008a).

LIFE HISTORY Adults migrate upstream from brackish areas to spawn in freshwater. Because they require flooded vegetation for spawning and rearing, they are frequently found in areas subject to flooding. The onset of spawning in the upper Delta seems to be associated with increasing water temperature and day length between early March and May. Spawning begins by

Appendix B.2

Special-Status Wildlife Species Descriptions

late January and early February and continues through July, with most spawning taking place from February through April (USFWS 2008a).

Splittail are benthic foragers that feed extensively on opossum shrimp (*Neomysis mercedis*) although detrital material typically makes up a high percentage of their stomach contents. They will feed opportunistically on earthworms, clams, insect larvae, and other invertebrates (USFWS 1995).

POTENTIAL TO OCCUR It is unlikely that Sacramento splittail occur within the Project area. Extant populations are not known along the San Joaquin River upstream of its confluence with the Merced River (USFWS 1995). It is possible that Sacramento splittail once inhabited the San Joaquin River within the Project area, however the river is now frequently dry, eliminating essential habitat for the fish. Within the Project area, the Fresno Slough does provide potential habitat for this species. The Mendota Dam, located at the outflow of the Mendota Pool within the Project vicinity, is a barrier to fish passage, although it is not known if fish populations upstream and downstream from the dam are completely isolated from one another.

Steelhead (*Oncorhynchus mykiss irideus*) – Central Valley ESU – FT

STATUS The Central Valley steelhead is an Environmentally Significant Unit (ESU) and is listed as a federally threatened species (CDFG 2008).

DISTRIBUTION The historical range of steelhead occurred throughout the north Pacific Ocean from the Kamchatka Peninsula in Asia to the northern Baja Peninsula. Steelhead likely inhabited most coastal and inland streams in Washington, Oregon and California as well as many inland streams in Idaho. The current range of steelhead extends from the Kamchatka Peninsula south to the San Diego River in southern California.

The range of the Central Valley Steelhead ESU extends from north of Redding south to the Modesto area (NOAA 2007). The ESU straddles the Sacramento and San Joaquin River, ranging from approximately 20 miles to 70 miles in width extending east and west from these rivers.

HABITAT Steelhead spawn in cool, clear, well-oxygenated streams with suitable depth, current velocity, and gravel size. Data collected above steelhead redds reported steelhead spawning at depths of 0.1 to 1.5 meters (m), current velocities of 23 to 155 cubic feet per second (cfs), and in gravel 0.6 to 12.7 centimeters (cm) in diameter. Steelheads usually spawn in the tail of pools or in riffles with gravel substrate. The female digs a pit in the gravel where she deposits her eggs. Often more than one male will fertilize the eggs before the female covers the eggs with gravel, creating a redd. Females often deposit only a fraction of their eggs in a given redd, moving to a nearby area and repeating the process until all eggs are deposited. The eggs and newly-hatched fry (alevins) buried in the gravel require a constant flow of water through the gravel to provide dissolved oxygen and to carry away metabolic waste products.

Temperature influences both the survival and development of steelhead embryos. Northern steelhead stocks have been reported to spawn at temperatures of 3.9° C (39° F) to 9.4° C (49° F), although normal development of steelhead embryos is reported to occur between 7.0° C (45° F) and 12.0° C (54° F). A daily average temperature of 20° C (68° F) or lower has been used in central and southern California by CDFG to describe suitable thermal conditions for rearing steelhead.

LIFE HISTORY Steelhead is the anadromous form of *O. mykiss*, although steelhead may also exhibit a life-history type that spends its entire lifecycle in freshwater. Anadromy is a life-history pattern in which growth and maturity occur in saltwater, but spawning and some juvenile rearing occur in freshwater.

Spawning begins in late December and can extend into April (NatureServe 2008). All *O. mykiss* hatch in the gravel-cobble substrate of coldwater streams. After two to three weeks the young fry

Appendix B.2

Special-Status Wildlife Species Descriptions

begin to emerge from the gravel and begin to feed in the stream. Some begin to disperse downstream in the months following emergence but most continue to rear within the vicinity of their natal stream reach for a period of up to a few years.

Steelhead undergo physiological changes in the process of smoltification that allow them to adapt to seawater. These fish spend a variable amount of time in the ocean, typically one to two years, grow rapidly and return to spawn, generally in the stream where they hatched. They do not necessarily die after spawning.

In California, many streams support both resident and anadromous forms with no observable genetic differentiation.

Steelhead fry and juveniles feed on a variety of invertebrates including aquatic and terrestrial insects, amphipods, and snails. The diet of adults varies seasonally and by habitat. Food items include fish, crustaceans, drift organisms and other invertebrates (NatureServe 2008).

POTENTIAL TO OCCUR It is unlikely that steelhead would occur in the Project area. Anadromous steelhead are known to occur downstream of the Project vicinity along the San Joaquin River, but the ESU is not thought to occur very far south of Modesto. The closest areas known to be occupied by Central Valley steelhead is in northern Merced County (NOAA 2007). Within the Project area the San Joaquin River is frequently dry, which makes the area unavailable to steelhead. The Fresno Slough provides only marginal habitat for steelhead due to high water temperatures. The Mendota Dam, located at the outflow of the Mendota Pool within the Project vicinity, is a barrier to fish passage, although it is not known if fish populations upstream and downstream from the dam are completely isolated from one another.

AMPHIBIANS AND REPTILES

California Tiger Salamander (*Ambystoma californiense*) – FT, SC

STATUS The California tiger salamander is federally listed as threatened in central California, and is a California species of special concern (CDFG 2008).

DISTRIBUTION California tiger salamander is an endemic species to central California. They are found in vernal pool complexes in Santa Barbara and Sonoma Counties, in the Central Valley from Colusa County south to Kern County and in coast ranges from the San Francisco bay area south to the Temblor Range. California tiger salamanders have been extirpated from more than half of their documented historic breeding sites.

HABITAT California tiger salamander habitat has two distinct components. The most obvious and best known habitat comprises rain pools used for spawning. But far more important for the survival of individuals and colonies is the presence of burrow complexes of California ground squirrel and Botta's pocket gopher in grasslands and sparse oak woodlands.

LIFE HISTORY This salamander spends about 80 to 90 percent of the year in mammal burrows (which prevent desiccation during the hot dry summer season), a condition that is characteristic of the majority of the species' range in California. Typically, California tiger salamanders emerge from rodent burrows several times on rainy nights during the autumn and winter, and migrate to traditional spawning pool sites filled by winter rains. Eggs are deposited singly or in small clusters on submerged plant stems, hatching within a few days. After spawning, the adult salamanders return to the rodent burrow complexes, and move deep underground. The cycle commences again with the first heavy rains of autumn. Larvae metamorphose in late spring, not long before the spawning pools begin to dry out.

Larvae eat various aquatic invertebrates and amphibian larvae. Adults eat terrestrial invertebrates and sometimes small vertebrates (NatureServe 2008).

Appendix B.2

Special-Status Wildlife Species Descriptions

POTENTIAL TO OCCUR California tiger salamander may occur within the Project area. Mammal burrows and ephemeral wetlands are available within the Project area.

Western Spadefoot Toad (*Spea hammondi*) - SC

STATUS Western spadefoot toad is a Species of Special Concern in California (CDFG 2008).

DISTRIBUTION Historically, the western spadefoot ranged from Redding to northwestern Baja California. In California, the species was found throughout the Central Valley, and in the Coast Ranges and coastal lowlands from San Francisco Bay to Mexico. It has been extirpated from many locations within this range (USFWS 2008b).

Since 1990, there have been sightings in Alameda, Butte, Calaveras, Fresno, Kern, Kings, Los Angeles, Madera, Merced, Monterey, Orange, Placer, Riverside, Sacramento, San Benito, San Diego, San Joaquin, San Luis Obispo, Santa Barbara, Stanislaus, Tulare, Ventura and Yolo counties (USFWS 2008b).

HABITAT Western spadefoot toads are primarily a species of lowland habitats such as washes, floodplains of rivers, alluvial fans, playas, and alkali flats. However, they also occur in the foothills and mountains (USFWS 2005).

Western spadefoot toads prefer areas of open vegetation and short grasses, where the soil is sandy or gravelly. They are found in the valley and foothill grasslands, open chaparral, and pine-oak woodlands. Western spadefoot toads require two distinct habitat components in order to meet life history requirements, and these habitats probably need to be in close proximity. Spadefoot toads are primarily terrestrial, and require upland habitats for feeding and for constructing burrows for their long dry-season dormancy.

Typical of amphibians, wetland habitats are required for reproduction. Western spadefoot toad eggs and larvae have been observed in a variety of permanent and temporary wetlands including rivers, creeks, pools in intermittent streams, vernal pools, and temporary rain pools. It appears that vernal pools and other temporary wetlands may be optimal for breeding due to the absence or reduced abundance of both native and nonnative predators, many of which require more permanent water sources (USFWS 2005).

Western spadefoot toads have also exhibited a capacity to breed in altered wetlands as well as man-made wetlands (USFWS 2005).

The species is found mostly below 3000 ft, but can occur up to 4500 ft. The average elevation of sites where the species still occurs is significantly higher than the average elevation for historical sites, suggesting that declines have been more pronounced in lowlands (USFWS 2008b).

LIFE HISTORY During dry periods, spadefoot toads construct and occupy burrows. Individuals may remain in these burrows for 8 to 9 months, where they enter a state of torpor. Spadefoot toads appear to construct burrows in soils that are relatively sandy and friable as these soil attributes facilitate both digging and water absorption. Spadefoot toads emerge from burrows to forage and breed following rains in the winter and spring (USFWS 2005).

Western spadefoot toads breed from January to May in temporary pools. Water temperatures in these pools must be between 48° F and 86° F. Breeding calls are audible at great distances which serves to bring individuals together at suitable breeding sites.

Eggs are deposited on plant stems or pieces of detritus in temporary rain pools, or sometimes pools in ephemeral stream courses. Eggs hatch in 0.6-6 days depending on temperature. Larval development can be completed in 3 to 11 weeks (USFWS 2008b).

Appendix B.2

Special-Status Wildlife Species Descriptions

Typical of toads, adult western spadefoot toads will forage on a variety of insects, worms, and other invertebrates, including grasshoppers, true bugs, moths, ground beetles, predaceous diving beetles, ladybird beetles, click beetles, flies, ants and earthworms (USFWS 2008b).

POTENTIAL TO OCCUR Western spadefoot toads are known to occur within the Project vicinity. Suitable grassland and wetland habitats exist within the Project area.

Western Pond Turtle (*Actinemys marmorata*) - SC

STATUS Western pond turtle is a Species of Special Concern in California (CDFG 2008).

DISTRIBUTION Historically, this turtle had a relatively continuous distribution in most Pacific slope drainages from Klickitat County, Washington, to Arroyo Santo Domingo, northern Baja California, Mexico. The known elevational range of the western pond turtle extends from near sea level to about 4,690 ft. In California, it is still present in most Pacific slope drainages between the Oregon and Mexican borders (CDFG 2005).

HABITAT Western pond turtles require some slack- or slow-water aquatic habitat. Pond turtles are uncommon in high gradient streams probably because their local distribution may be limited by water temperatures, current velocity, food resources, or any combination thereof. Habitat quality seems to vary with the availability of aerial and aquatic basking sites; however, western pond turtles often reach higher densities where many aerial and aquatic basking sites are available. Hatchlings require shallow water habitat with relatively dense submergent or short emergent vegetation in which to forage. Western pond turtles also require an upland oviposition site in the vicinity of the aquatic site. Suitable oviposition sites must have the proper thermal and hydraulic environment for incubation of the eggs.

LIFE HISTORY Mating, which has been rarely observed, typically occurs in late April or early May, but may occur year-round. Females migrate from the aquatic site to an upland location and deposit eggs in a shallow excavation. Oviposition occurs during May and June, although some individuals may deposit eggs as early as late April and as late as early August.

Nests are typically dug in a substrate with high clay or silt fraction, located on a slope that is unshaded to ensure that substrate temperatures will be high enough to incubate the eggs. Nesting sites can be up to 1,320 ft from the aquatic site, but the majority of nests located to date are within 660 ft.

This aquatic turtle usually leaves the aquatic site to reproduce, aestivate, and overwinter. However, western pond turtles may overwinter on land or in water, or may remain active in water during the winter season.

This species is considered omnivorous. Aquatic plant material, including pond lilies, beetles and a variety of aquatic invertebrates as well as fishes, frogs, and even carrion have been reported among their food (CDFG 2005).

Two subspecies of western pond turtle occur in California, *A. m. marmorata* and *A. m. pallida*. Populations of the western pond turtle in much of the Central Valley are considered to be intergrades between these two subspecies (CALHERPS 2008).

POTENTIAL TO OCCUR Western pond turtles are known to occur within the Project vicinity. Suitable wetland habitats exist within the Project area.

Blunt-nosed leopard lizard (*Gambelia sila*) - FE/CFP

STATUS This species is listed as Federally Endangered and Fully Protected and Endangered by the State of California (CDFG 2008).

Appendix B.2

Special-Status Wildlife Species Descriptions

DISTRIBUTION The blunt-nosed leopard lizard is endemic to the San Joaquin Valley of central California. Historically, this species probably occurred from Stanislaus County in the north, southward to the Tehachapi Mountains in Kern County. Except where their range extends into the Carrizo Plain and Cuyama Valley west of the southwestern end of the San Joaquin Valley, the foothills of the Sierra Nevada and Coast Range Mountains, respectively, define the eastern and western boundaries of its distribution. The blunt-nosed leopard lizard is not found above 800 m (2,600 ft) in elevation. The currently known occupied range of the blunt-nosed leopard lizard is in scattered parcels of undeveloped land on the Valley floor, and in the foothills of the Coast Range. Surveys in the northern part of the San Joaquin Valley documented the occurrence of the blunt-nosed leopard lizard in the Firebaugh and Madera Essential Habitat Areas (USFWS 1998).

HABITAT Blunt-nosed leopard lizards inhabit open, sparsely vegetated areas of low relief on the San Joaquin Valley floor and in the surrounding foothills. On the Valley floor, they are most commonly found in the Nonnative Grassland and Valley Sink Scrub communities described by Holland. The Valley Sink Scrub is dominated by low, alkali-tolerant shrubs of the family Chenopodiaceae, such as iodine bush, and seepweeds. The soils are saline and alkaline lake bed or playa clays that often form a white salty crust and are occasionally covered by introduced annual grasses. Today, nearly all the remaining Valley sink scrub on the Valley floor is seasonally flooded fragments of this historical community (USFWS 1998).

Valley Needlegrass Grassland, Nonnative (Annual) Grassland, and Alkali Playa also provide suitable habitat for the lizard on the Valley floor. Valley Needlegrass Grassland is dominated by native perennial bunchgrasses, including purple needlegrass (*Nassella pulchra*) and alkali sacaton. Associated with the perennial grasses are native and introduced annual plants. Both the Valley Needlegrass Grassland and Nonnative/Annual Grassland occur on fine-textured soils and probably were widespread in the Valley before large areas were converted to agriculture. The Alkali Playa community occurs on poorly drained, saline and alkaline soils in small, closed basins. The small, widely spaced, dominant shrubs include: iodine bush, saltbushes, and greasewood (*Sarcobatus vermiculatus*) (USFWS 1998).

LIFE HISTORY Seasonal above-ground activity is correlated with weather conditions, primarily temperature. Optimal activity occurs when air temperatures are between 23.5 ° and 40.0 ° C (74 and 104 ° F) and ground temperatures are between 22 ° and 36 ° C (72 and 97 ° F). Adults retreat to their burrows beginning in August or September, but hatchlings are active until mid-October or November, depending on weather (USFWS 1998).

Breeding activity begins within a month of emergence from dormancy and lasts from the end of April through the beginning of June, and in some years to near the end of June. Copulation may occur as late as June (USFWS 1998).

Eggs are laid in June and July. Under adverse conditions, egg-laying may be delayed 1 or 2 months or reproduction may not occur at all. Eggs are laid in a chamber either excavated specifically for a nest or already existing within the burrow system. After about 2 months of incubation, young hatch from July through early August, rarely to September (USFWS 1998).

Leopard lizards use small rodent burrows for shelter from predators and temperature extremes. Burrows are usually abandoned ground squirrel tunnels, or occupied or abandoned kangaroo rat tunnels (USFWS 1998).

Blunt-nosed leopard lizards feed primarily on insects (mostly grasshoppers, crickets, and moths) and other lizards. They appear to feed opportunistically on animals, eating whatever is available in the size range they can overcome and swallow. Young of its own species also are eaten (USFWS 1998).

Appendix B.2

Special-Status Wildlife Species Descriptions

POTENTIAL TO OCCUR Blunt-nosed leopard lizards are known to occur within the Project vicinity. Suitable desert scrub habitat is present, and several areas occupied by this species are located nearby.

California Horned Lizard (*Phrynosoma coronatum frontale*) - SC

STATUS The California horned lizard is a California species of special concern (CDFG 2008).

DISTRIBUTION This species has a wide range in California, occurring in the Coast Ranges from southern Sonoma County, in the Central Valley from southern Tehama County, in the Sierra foothills from Butte to Tulare County below 4,000 ft, and in the Southern California deserts and mountains below 6,000 ft (CDFG 2005).

HABITAT The California horned lizard is uncommon to common in open country – especially sandy areas, washes, flood plains, and wind-blown deposits in a wide variety of habitats including valley foothill hardwood, conifer, and riparian habitats, as well as in pine-cypress, juniper, and annual grass habitats (CDFG 2005).

LIFE HISTORY The reproductive season for the California horned lizard varies from year to year and geographically depending on local conditions, but egg-laying is generally thought to occur in May and June. Nests are constructed in loose soil. Eggs are thought to hatch after two months. This species is generally inactive during colder temperatures in the fall and winter (CDFG 2005).

Horned lizards prefer to eat ants, but they will also eat many other types of invertebrates, such as grasshoppers, beetles, and spiders (CDFG 2005).

POTENTIAL TO OCCUR California horned lizards are known to occur within the Project vicinity. Suitable open and grassland habitats exist within the Project area.

Silvery Legless Lizard (*Anniella pulchra pulchra*) - SC

STATUS This species is listed as a Species of Concern in California (CDFG 2008).

DISTRIBUTION Silvery legless lizard has a spotty distribution from near Antioch, California, south in Coast Ranges, Transverse Mountains, and Peninsular Ranges, and along coast of southern California, to Arroyo Pabellon, northwestern Baja California; scattered occurrences in San Joaquin Valley; southern Sierra Nevada; Walker Basin; Piute, Scodie, and Tehachapi mountains; and in desert edge localities at the eastern end of Walker Pass in Kern County, Morongo Valley, in Riverside County, Little San Bernardino Mountains at Whitewater in Riverside County, and on the eastern slope of the Peninsular Ranges (CalHerps 2008).

HABITAT This species burrows in loose soil, especially in semi-stabilized sand dunes and also in other areas with sandy soil, in areas vegetated with oak or pine-oak woodland, or chaparral; also wooded stream edges, and occasionally desert-scrub. Bush lupine often is an indicator of suitable conditions. Often found in leaf litter, under rocks, logs, and driftwood (NatureServe 2008).

Silvery legless lizards are found from sea level to about 5,100 ft (1550 m) (NatureServe 2008).

LIFE HISTORY Ovulation takes place between May and July. Oviducal eggs are laid between July and October. Live births occur from September to November, mostly likely peaking in October (NatureServe 2008).

Silvery legless lizards feed on insect larvae, beetles, termites and spiders (CalHerps 2008, NatureServe 2008).

POTENTIAL TO OCCUR Silvery legless lizard is known to occur within the Project vicinity. Some suitable wooded and sandy habitats are present in the Project vicinity. (CDFG 2005).

Appendix B.2

Special-Status Wildlife Species Descriptions

San Joaquin Whipsnake (*Masticophis flagellum ruddocki*) - SC

STATUS Designated a species of special concern by the state of California (CDFG 2008).

DISTRIBUTION This subspecies is endemic to California, ranging from Arbuckle in the Sacramento Valley in Colusa County southward to the Grapevine in the Kern County portion of the San Joaquin Valley and westward into the inner South Coast Ranges. An isolated population occurs in the Sutter Buttes. It is found from 20 m to around 900 m above sea level (CDFG 2005).

HABITAT San Joaquin choachwhip occurs in open, dry, treeless areas, including grassland and saltbush scrub. It takes refuge in rodent burrows, under shaded vegetation, and under surface objects (CalHerps 2008). *Masticophis flagellum* in California are found in a variety of other habitats, including desert, chaparral, and pasture habitats (CDFG 2005).

LIFE HISTORY Little is known about the breeding habits of this subspecies. San Joaquin coachwhip presumably mates in May and lays eggs in early summer which hatch in 45 - 70 days (CalHerps 2008). Other coachwhip subspecies mate in April and May. Eggs are laid June and July, and the first young appear in late August or early September. Clutch size ranges from 4 to 16 eggs with a mean of 8 to 10. The incubation period in laboratory conditions is 76-79 days (CDFG 2005).

Coachwhips are probably preyed upon by roadrunners and birds of prey (CDFG 2005).

This species eats small mammals including bats, nestling and adult birds, bird eggs, lizards, snakes, amphibians, and carrion. Hatchlings and juveniles will eat large invertebrates (CalHerps 2008).

POTENTIAL TO OCCUR San Joaquin whipsnake are known to occur within the Project vicinity. Suitable open habitats exist within the Project area.

Giant Garter Snake (*Thamnopsis giga*) - FT

STATUS Giant garter snake is listed as a Threatened Species by the federal government and by the State of California (CDFG 2008).

DISTRIBUTION The giant garter snake is endemic to the Central Valley of California. Historically, this snake ranged from Kern County north along the Central Valley to Butte County, with a gap in the central part of the valley. Currently, ranges from Glenn County to the southern edge of the San Francisco Bay Delta, and from Merced County to northern Fresno County, apparently no longer occurring south of northern Fresno County (CDFG 2005, USFWS 1999).

HABITAT Found primarily in marshes, sloughs, ponds, small lakes, drainage canals, irrigation ditches, rice fields, slow-moving creeks and adjacent upland areas (USFWS 1999). Rice fields and vegetated irrigation ditches in particular are known to provide quality artificial habitat for this species. Giant garter snakes prefer locations with vegetation close to the water for basking, without excessive shading.

LIFE HISTORY This species is highly aquatic. It is active during daylight, and at night in hot weather. Giant garter snakes emerge from overwintering sites in March and April. Activity peaks in April and May. Basks on vegetation near water in spring, and utilizes animal burrows and vegetation piles during hotter weather). In summer, snakes often move out of marshland habitats into rice fields (USFWS 1999). By November, most snakes are overwintering in animal burrows, although they may have some limited activity aboveground during winter months. (USFWS 1999).

Mating takes place soon after emergence in the spring. Females bear live young from July through early September (USFWS 1999).

Appendix B.2

Special-Status Wildlife Species Descriptions

Giant garter snake feeds primarily on aquatic fish, frogs and tadpoles. Prey species include Pacific chorus frog, Sacramento blackfish, mosquito fish and carp (USFWS 1999). Historical prey has been extirpated in much of this snake's range, leaving it to consume introduced fish and bullfrogs (CDFG 2005). They may be active both diurnally and nocturnally (USFWS 1999).

POTENTIAL TO OCCUR Giant garter snakes are known to occur within the Project vicinity, in the Mendota Wildlife Area (CDFG 2005). Suitable wetland habitat exists within the Project area.

BIRDS

Tule Greater White-fronted Goose (*Anser albifrons elgasii*) - SC

STATUS Tule Greater White-fronted Goose is considered a Species of Special Concern in California (CDFG 2008).

DISTRIBUTION This subspecies of greater white-fronted goose breeds in Cook Inlet area of Alaska and winters primarily in the Central Valley of California. Most of these wintering birds are found in the Sacramento Valley (Ely and Dzubin 1994).

HABITAT Wintering habitat for greater white-fronted goose is similar to that of other geese in California. They often roost in large, freshwater wetlands and forage in agricultural areas. This subspecies uses marshes more than other subspecies (CDFG 2005, Ely and Zubin 1994).

LIFE HISTORY Tule geese often remain segregated from other white-fronted geese in the Klamath Basin before continuing on to wintering areas in Central Valley and Sacramento-San Joaquin Delta of California by late September early October. Northward migration may begin as early as February for all populations of white-fronted geese in California (Ely and Dzubin 1994).

Tule Geese winter sympatrically in Sacramento Valley and Sacramento-San Joaquin (S-SJ) Delta, CA, with Greater White-fronted Geese (*A. a. frontalis*) from the Yukon Delta, but there is considerable microgeographic resource partitioning on wintering areas. Tule Geese are largely restricted to Sacramento Valley and Suisun marshes of California during winter. Tule Geese are large marsh birds; geese of Yukon Delta origin more commonly feed in large open fields. Considerable segregation at night roosts (Ely and Dzubin 1994).

Seeds, grains and grasses are typical winter foods for greater white-fronted geese (Ely and Dzubin 1994).

POTENTIAL TO OCCUR Tule greater white-fronted geese may potentially occur within the Project vicinity. Suitable marsh and agricultural habitat exists within the Project area. The Mendota Wildlife Area and surrounding farmland is known to support large numbers of geese of several species fall through spring.

“Aleutian” Cackling Goose (*Branta hutchinsii leucopareia*) - FD

STATUS Delisted from the Endangered Species List (CDFG 2008).

DISTRIBUTION This species breeds in the Aleutian Islands off Alaska and winters primarily in California. Areas with large populations of wintering birds are Humboldt and Del Norte counties and in several areas throughout the Central Valley of California (CDFG 2005).

HABITAT Preferred wintering habitats for Aleutian cackling goose include lacustrine, fresh emergent wetlands, and moist grasslands, croplands, pastures, and meadows (CDFG 2005).

LIFE HISTORY This subspecies is generally present in California from October to April (NatureServe 2008).

Appendix B.2

Special-Status Wildlife Species Descriptions

In California, Aleutian cackling geese feed mainly on green shoots and seeds of cultivated grains and wild grasses and forbs, by grazing and gleaning in moist fields. They also feed on aquatic plants (CDFG 2005).

POTENTIAL TO OCCUR This species is known to occur. Suitable wetland and agricultural habitats exist within the Project area. Aleutian cackling geese were observed in the Project vicinity during a site visit in February, 2008.

Redhead (*Aythya americana*) - SC

STATUS Redhead is a Species of Special Concern in California (CDFG 2008).

DISTRIBUTION Redheads are widely distributed in North America, breeding as far north as Alaska and wintering south into Mexico. This species has a scattered distribution in California, with large numbers occurring in the Imperial Valley, the Central Valley, the Klamath Valley and the northeastern plateau region (Kaufman 1996). In the Central Valley, where they are known to breed, they are present throughout the year (Kemper 2001).

HABITAT Redheads are found in lakes, saltwater bays, estuaries and freshwater marshes. Large marshes are favored as breeding areas (Kaufman 1996).

LIFE HISTORY Breeding activity has been recorded between April and September in California (CDFG 2005). Nests are located in dense marshes above shallow water. This species is considered to be a nest parasite. Female redheads often “dump” their eggs in nests of other redheads or other waterfowl. Incubation lasts 23-29 days, and young fledge 60-65 days after hatching (Kaufman 1996).

This species feeds on leaves, stems, seeds and roots of aquatic plants such as shoalgrass, pondweeds, smartweeds, sedges and waterlilies. Aquatic insects and mollusks are also eaten (Kaufman 1996).

POTENTIAL TO OCCUR

Redheads may potentially occur within the Project vicinity. The area is within the species' known distribution and has suitable wetland habitat.

Barrow's Goldeneye (*Bucephala islandica*) – SC

STATUS Barrow's goldeneye is a Species of Special Concern in California (CDFG 2008).

DISTRIBUTION Barrow's goldeneyes have a discontinuous distribution in North America. The smaller eastern population breeds in eastern Quebec, while in the west Barrow's goldeneyes breed from central Alaska south to Colorado and Oregon.

In the eastern part of their range, Barrow's goldeneyes winter primarily along the Atlantic coast of Canada south to New England. In western North America, they winter in coastal waters along immediate Pacific coast from Alaska south to Washington, with smaller numbers south to northern California. Also winters inland in small numbers on open rivers and lakes from southern interior of British Columbia south to northern California, lower Colorado River, and northern New Mexico.

In California, they formerly bred in the Cascades and Sierra Nevadas south to Fresno County, but there have been no recent breeding records. Wintering birds typically are found in the San Francisco Bay area and localized areas in inland northern California.

HABITAT

Appendix B.2

Special-Status Wildlife Species Descriptions

Barrow's goldeneyes breed on a variety of large ponds and lakes, usually without fish and not choked with emergent vegetation, often bordered by forest or rangeland. Goldeneyes need large tree cavities (often created by pileated woodpeckers or northern flickers) or nest boxes to nest in. They winter mostly in marine habitats, with a few inland on open rivers and lakes.

LIFE HISTORY On the Pacific coast, northward migration begins late February with a peak in late March to early April. In California, they have been recorded as late as late March. Fall migrants arrive by mid-October.

Diet varies with season and habitat. Diets in freshwater in winter are diverse, and can consist of insects, salmon eggs and parr, mollusks, crustaceans and vegetation.

POTENTIAL TO OCCUR Some suitable wetland wintering habitat may be found in the Project vicinity.

American White Pelican (*Pelecanus erythrorhynchos*) - SC

STATUS American white pelican is a Species of Special Concern in California (CDFG 2008).

DISTRIBUTION This species breeds in scattered locations from western Manitoba and Minnesota westward to northern California. Wintering populations are found in California and along the Gulf Coast of the United States south to southern Mexico (Kaufman 1996).

American white pelicans are widespread in California, occurring in large lakes, marshes and coastal areas throughout much of the state. They currently are only known to nest in large lakes and wetlands in the Klamath Basin (CDFG 2005).

HABITAT American white pelicans are found in a variety of large lakes, marshes and saltwater bays and estuaries. In California, breeding sites are inland and are located on isolated islands in lakes (CDFG 2005, Kaufman 1996).

LIFE HISTORY American white pelicans are present in California year-round, although they are only common at breeding sites in the Klamath Basin from April to August. This species no longer is known to breed in the Central Valley (CDFG 2005), probably due to loss of suitable nesting habitat and disturbance by human activities.

American white pelicans feed primarily on fish, as well as crayfish and salamanders (Kaufman 1996).

POTENTIAL TO OCCUR American white pelicans are known to occur within the Project vicinity. Suitable wetland habitat exists in the Project area. Several were observed during a site visit in February, 2008.

White-tailed Kite (*Elanus leucurus*) - CFP

STATUS White-tailed Kite is a California Fully Protected Species (CDFG 2008).

DISTRIBUTION This species is common in Central and South America, but has a very limited distribution north of Mexico (NatureServe 2008). They are common in California and Texas, with smaller populations in Oregon and Washington (Dunk 1995). They are widespread in California but are absent in desert, high elevation and heavily forested areas (CDFG 2005).

HABITAT This species is found in a wide variety of open habitats in North America, including open oak grassland, desert grassland, farm country and marshes (Kaufman 1996).

Appendix B.2

Special-Status Wildlife Species Descriptions

LIFE HISTORY White-tailed kites are resident year round in California and not considered a highly migratory species. Breeding activity can begin as early as February and last until October (CDFG 2005).

Nests are located in the tops of trees, usually 20-50 ft above ground. Live oaks are favored nest trees. Incubation lasts between 26-32 days and young fledge 30-35 days after hatching (Kaufman 1996).

This species feeds on small rodents such as voles and house mice. Pocket gophers, harvest mice, rats, young rabbits, birds, reptiles, amphibians and insects may be taken as well (Kaufman 1996).

POTENTIAL TO OCCUR White-tailed kites are known to occur within the Project vicinity. Suitable wetland and grassland habitat exists within the Project area. This species was observed during a site visit in February, 2008.

Bald Eagle (*Haliaeetus leucocephalus*) - FD/CE/CFP

STATUS Bald eagle has been delisted from the federal endangered species list. It is listed as Endangered and Fully Protected by the State of California. It receives additional protection under the Bald and Golden Eagle Protection Act (CDFG 2008).

DISTRIBUTION Bald eagles occur throughout North America, usually near large bodies of water. In winter bald eagles are more common in the continental United States as northern birds move into the area (Wheeler and Clark 1995).

In California, they can be found throughout the state in appropriate habitat except in deserts and heavily urbanized areas. Most breeding birds are found in northern California and in the Sierra Nevada range but other breeding areas are scattered around the state, usually near large lakes. Recent studies have shown that the Central Valley is highly used by bald eagles in winter (SCPBRG 2008).

HABITAT Bald eagles are closely associated with water throughout their range. They can be found along coasts, rivers, large lakes and other wetlands. They may occasionally be found in open country habitats (Kaufman 1996).

LIFE HISTORY Wintering populations of bald eagles begin appearing in the state in September and depart by the end of April. Breeding activities can begin in February and end in July (CDFG 2005).

Bald eagle nests in large, old-growth, or dominant live tree with open branchwork, especially ponderosa pine. Nests most frequently in stands with less than 40% canopy, but usually some foliage shading the nest. Often chooses largest tree in a stand on which to build stick platform nest. The nest is located 16-61 m (50-200 ft) above ground, usually below tree crown. It is usually located near a permanent water source (CDFG 2005).

Although bald eagles seem to prefer fish as prey, they are opportunistic feeders. A variety of water birds, aquatic and terrestrial mammals, reptiles and amphibians are also preyed upon. Carrion is frequently fed on as well (Buehler 2000).

POTENTIAL TO OCCUR Bald eagles may potentially occur in the Project area. Suitable wetland habitat exists within the Project area.

Northern Harrier (*Circus cyaneus*) - SC

STATUS Northern harrier is a Species of Special Concern in California (CDFG 2008).

Appendix B.2

Special-Status Wildlife Species Descriptions

DISTRIBUTION This species is one of the most widespread North American raptors, ranging from Alaska east across Canada and south to northern South America (Sibley 2000, NatureServe 2008). The breeding range for most of the population extends from central California east to the mid-Atlantic seaboard and northward. They can be found wintering through most of their range in the United States (Sibley 2000).

In California they can be found throughout the state in appropriate habitat (Sibley 2000).

HABITAT Harriers can be found in a variety of open habitats, including wetlands, fields, prairies, agricultural areas, arid areas and sagebrush flats from sea level up to 10,000 ft in elevation (Kaufman 1996, CDFG 2005).

LIFE HISTORY Harriers are present in California throughout the year, but are more abundant and widespread in winter (Kemper 2001).

Spring migration is protracted, and can begin as early as late February. Eggs are laid anytime between late March and mid-May (Macwhirter and Bildstein 1996). This species nests on ground in shrubby vegetation, usually at marsh edge. Most nests are located in emergent wetland or along rivers or lakes, but may also be located in grasslands, grain fields, or on sagebrush flats several miles from water (CDFG 2005). Fall migration in California can last several months, beginning in late August (Macwhirter and Bildstein 1996).

Harriers feed on voles, rats and a variety of other rodents. Small songbirds, doves and waterfowl may also be preyed on as well. Large insects, snakes, lizards, toads and frogs are also preyed upon (Kaufman 1996).

POTENTIAL TO OCCUR This species are known to occur in the Project vicinity. Northern harriers were observed on a site visit in February, 2008. Suitable wetland and grassland habitat exists within the Project area.

Swainson's Hawk (*Buteo swainsoni*) - CT

STATUS Swainson's hawk is listed as a Threatened Species by the State of California (CDFG 2008).

DISTRIBUTION Breeding populations of Swainson's hawks can be found from inland areas of the Pacific Coast states north across southern Canada, east to Illinois and south into northern Mexico. Most birds winter in Argentina and Uruguay, although some winter further northward into Mexico and Central America. Rare but regular in the winter in California, Texas and Florida (NatureServe 2008, Herzog 1996).

In California, breeding populations are located in the northeast plateau region, through the central valley and a few locations in southern and eastern California (CDFG 2005).

HABITAT Swainson's hawks are found in open plains, grasslands, farmland, ranch country and sometimes wetlands (Kaufman 1996, Herzog 1996). They may occur over a wide variety of habitats during migration.

LIFE HISTORY Swainson's hawks begin arriving in California from breeding grounds in late February. After breeding, most individuals have migrated south by the end of September (Kemper 2001).

Breeding occurs late March to late August, with peak activity late May through July (CDFG 2005). The nest is located in a tree or large shrub in open country, usually 15-30 ft off the ground. It is generally well-hidden in the foliage. Less often the nest is located on a cliff or steep slope. Incubation lasts 35-45 days, young fledge 42-44 days after hatching (Kaufman 1996).

Appendix B.2

Special-Status Wildlife Species Descriptions

Swainson's hawks prey on small mammals and reptiles in early summer and large insects during other seasons. When feeding young, this species preys on ground squirrels, pocket gophers, mice, snakes, lizards and small birds. Grasshoppers, caterpillars and dragonflies are also important prey items (Kaufman 1996).

POTENTIAL TO OCCUR This species is known to occur in the Project vicinity. Suitable grassland and agricultural habitats exist within the Project area.

Golden Eagle (*Aquila chrysaetos*) - CFP

STATUS Golden eagle is listed as a Fully Protected Species in California and has additional protection under the Bald and Golden Eagle Protection Act of 1940 (CDFG 2008).

DISTRIBUTION Golden eagles are widespread in the Northern Hemisphere. In North America, they are most common from Alaska east across Canada and south into the United States and northern Mexico, where they are most common west of the Mississippi River (Kaufman 1996). They can be found year round throughout much of California, although they avoid heavily urbanized areas.

HABITAT Golden eagles prefer open mountains, foothills, plains and open country. They require large expanses of open terrain for foraging. They also use deserts and wetland areas (Kaufman 1996).

LIFE HISTORY Breeding activity occurs between late January and August. Eggs are laid between February and May (CDFG 2005). Nest sites are located in large trees or cliff ledges. Incubation may take up to 45 days and young fledge between 60-70 days of age. Nesting birds are very sensitive to human disturbance (Kaufman 1996).

Golden eagles feed primarily on small mammals, such as ground-squirrels, prairie dogs and jackrabbits. Smaller prey, such as mice and voles, or larger prey, such as foxes and young deer, are taken less frequently. Birds, reptiles and insects may occasionally be taken as well (Kaufman 1996).

POTENTIAL TO OCCUR Golden eagle may potentially occur as a migrant or winter visitor. Suitable grassland, wetland and agricultural habitat exist within the Project area. There is no suitable nesting habitat in the area.

American Peregrine Falcon (*Falco peregrinus anatum*) - FD/CE/CFP

STATUS Peregrine Falcon has been delisted from the Federal Endangered Species List. It is listed as an Endangered Species and Fully Protected by the State of California (CDFG 2008).

DISTRIBUTION Peregrine falcons have a circumpolar distribution. They can be found throughout the United States and Canada. In California, peregrine falcons can be found in much of the state except in desert areas in the eastern part of the state (CDFG 2005).

HABITAT Peregrines may occur in a wide range of habitats. These include a variety of open habitats, urban areas and desert mountains. They are often found near water, where they prey on shorebirds and waterfowl (Kaufman 1996)

LIFE HISTORY Breeding activity can begin in early March and goes to late August. Nests are located on cliffs, rocky ledges, large trees or man-made structures near water sources such as rivers, lakes and wetlands (CDFG 2005).

Appendix B.2

Special-Status Wildlife Species Descriptions

Peregrine falcons specialize on feeding on birds. Rock pigeons are a favored prey species in urban areas, but ducks, geese, shorebirds and gulls are commonly preyed upon in other habitats. Other birds and mammals may be taken as well (Kaufman 1996).

Peregrines are present year round in many parts of the state but are more widespread during the winter (CDFG 2005). In the Central Valley, peregrines are not present during the summer (CDFG 2005), probably due to the lack of suitable nest sites.

POTENTIAL TO OCCUR Peregrine falcon is known to occur within the Project vicinity. Suitable wetland habitat exists within the Project area. This species was observed during a site visit in February, 2008.

Greater Sandhill Crane (*Grus canadensis tabida*) – CT, FP

STATUS Greater sandhill crane (*G. c. tabida*) is listed as a Threatened Species and Fully Protected by The State of California (CDFG 2008).

DISTRIBUTION Both greater (*G. c. tabida*) and lesser (*G. c. canadensis*) sandhill cranes occur in California. Historically, greater sandhill crane was a fairly common breeder on northeastern plateau. Now reduced greatly in numbers, *G. c. tabida* breeds only in Siskiyou, Modoc and Lassen cos. and in Sierra Valley, Plumas and Sierra Counties. It winters primarily in the Sacramento and San Joaquin valleys from Tehama Co. south to Kings County (CDFG 2005).

HABITAT In summer, sandhill crane occurs in and near wet meadow, shallow lacustrine, and fresh emergent wetland habitats. In winter it frequents annual and perennial grassland habitats, moist croplands with rice or corn stubble, and open, emergent wetlands. It prefers relatively treeless plains. Habitats are similar for both subspecies of sandhill crane (CDFG 2005).

LIFE HISTORY The breeding population of sandhill cranes from north of California passes southward through the state in September and October and northward in March and April, and many individuals spend the winter (CDFG 2005).

When foraging, sandhill crane prefers open shortgrass plains, grain fields, and open wetlands. Moist sites are commonly used, but they also feeds on dry plains far from water. They feed on grasses, forbs, especially cereal crops (newly planted or harvested), roots, tubers, seeds, grains, earthworms, and insects. Larger prey, such as mice, small birds, snakes, frogs, and crayfish also are taken. Fruits and berries are eaten if available (CDFG 2005).

POTENTIAL TO OCCUR Sandhill cranes are known to occur in the Project vicinity. Both the *G. c. tabida* and *G. c. canadensis* subspecies are likely to occur. Suitable grassland and agricultural habitats exist within the Project area. Sandhill cranes of an unidentified subspecies were observed during a site visit in February, 2008.

Lesser Sandhill Crane (*Grus canadensis canadensis*) – SC

Lesser sandhill crane (*G.c. canadensis*) is listed as a Species of Special Concern in California (CDFG 2008).

The migratory, nonbreeding subspecies *G. c. canadensis* winters in the San Joaquin and Imperial valleys, and to a lesser extent in the Sacramento Valley. In southern California, concentrates on the Carrizo Plain, San Luis Obispo Co., with smaller flocks near Brawley, Imperial Co., and Blythe, Riverside Co. The latter 2 flocks may be partly, or largely, *G. c. tabida*, which formerly wintered more commonly in southern California, but which has declined greatly there and throughout its range (CDFG 2005).

Appendix B.2

Special-Status Wildlife Species Descriptions

In summer, sandhill crane occurs in and near wet meadow, shallow lacustrine, and fresh emergent wetland habitats. In winter it frequents annual and perennial grassland habitats, moist croplands with rice or corn stubble, and open, emergent wetlands. It prefers relatively treeless plains. Habitats are similar for both subspecies of sandhill crane (CDFG 2005).

The breeding population of sandhill cranes from north of California passes southward through the state in September and October and northward in March and April, and many individuals spend the winter (CDFG 2005).

Main foods taken are similar to *G. c. tabida* (CDFG 2005).

Sandhill cranes are known to occur in the Project vicinity. Both the *G. c. tabida* and *G. c. canadensis* subspecies are likely to occur. Suitable grassland and agricultural habitats exist within the Project area. Sandhill cranes of an unidentified subspecies were observed during a site visit in February, 2008.

Mountain Plover (*Charadrius montanus*) - SC

STATUS Mountain plover is a Species of Special Concern in California (CDFG 2008).

DISTRIBUTION Mountain plovers have a discontinuous distribution in their breeding range from Montana south to west Texas, much of which was historically shortgrass prairie. Wintering populations are located in California, Arizona, south Texas and Mexico (Kaufman 1996).

In California, Mountain Plovers favor the Central and Imperial Valleys for wintering areas, with low numbers occurring elsewhere (CDFG 2005).

HABITAT Semi-arid plains, grasslands, plateaus are used by mountain plovers. Short grass and bare soil are favored, including desert flats and plowed fields (Kaufman 1996).

LIFE HISTORY Mountain plovers usually arrive in California in late October and depart for breeding grounds by early March (Kemper 2001).

The diet of this species is not well known but probably consists mostly of insects (Kaufman 1996).

POTENTIAL TO OCCUR Mountain plovers are known to occur within the Project vicinity (The Yellowbill 2008). Suitable grassland and agricultural habitats exist within the Project area.

Black Tern (*Chlidonias niger*) - SC

STATUS Black tern is a Species of Special Concern in California (CDFG 2008).

DISTRIBUTION Black tern is a localized breeder from the northern United States through central Canada. They winter in marine and coastal areas in Central and northern South America, on both the Atlantic and Pacific coasts (Dunn and Argo 1995).

In California, black terns breed in the northeast plateau region of the state. In the Central Valley, they breed widely but patchily in an extensive area of rice fields in the Sacramento Valley and in a limited area of this habitat in the San Joaquin Valley near Merced, Merced County, and in Fresno County just south of Dos Palos, Merced County. The species also was breeding at eight scattered colonies elsewhere in the San Joaquin Valley, primarily in agricultural fields flooded by runoff from the previous winter's near record precipitation. In the Central Valley away from rice fields, the species appears to breed only irregularly in years of very high runoff (USFWS 1999).

HABITAT In their breeding range, this species uses shallow freshwater marshes with emergent vegetation, including prairie sloughs, margins of lakes, and occasionally river or island edges; sometimes cultivated rice fields. These same habitats are used in migration, as well as coastal areas, small wetlands and coastal areas (Dunn and Argo 1995).

Appendix B.2

Special-Status Wildlife Species Descriptions

LIFE HISTORY In California, black terns begin returning from wintering grounds in late March. Egg-laying begins in mid-late May in California. Young fledge from late July to mid-August. Fall movement may begin by late July. Most birds leave northern breeding range by mid- to late August (Dunn and Argo 1995)

The nest is usually built on floating substrate of matted dead marsh vegetation, detached root masses of predominant vegetation, boards, or muskrat-built feeding platforms of fresh-cut vegetation. (Dunn and Argo 1995)

Black terns consume a large variety of insects and other arthropods and both freshwater and marine fish (Dunn and Argo 1995).

POTENTIAL TO OCCUR Black terns are known to occur within the Project vicinity (National Audubon Society 2004). Suitable wetland habitat and rice fields exist within the Project area and vicinity.

Western Yellow-billed Cuckoo (*Coccyzus americanus occidentalis*) - FC/CE

STATUS Western yellow-billed cuckoo is a candidate for listing on the federal endangered species list and is listed as Endangered by the State of California (CDFG 2008).

DISTRIBUTION Yellow-billed cuckoos are widespread in the eastern United States. Western populations are scattered in the southwestern United States north to Montana and south to Central America (AZGF 2002).

Yellow-billed cuckoos that occur in the western United States are a distinct population segment (DPS). Populations west of the crest of the Rocky Mountains and the continental divide are considered to be in the western DPS (USFWS 2007).

The Sacramento River roughly between Colusa and Red Bluff; the South Fork of the Kern River upstream of Lake Isabella; and the lower Colorado River are the only areas in California that support significant breeding populations of the species. They have been extirpated throughout much of their historical range in the state. Formerly common in the San Joaquin Valley, there have been few sightings since the 1960s (USFWS 2007).

HABITAT Western cuckoos breed in large blocks of riparian habitats (particularly woodlands with cottonwoods (*Populus fremontii*) and willows (*Salix* sp.)). Dense understory foliage appears to be an important factor in nest site selection, while cottonwood trees are an important foraging habitat in areas where the species has been studied in California (USFWS 2007).

LIFE HISTORY Yellow-billed cuckoos are late spring migrants, often not arriving in breeding areas until mid-June. Birds begin fall migration in August. This species is rarely detected in California during migration (Kemper 2001).

Nests are often located in willow or mesquite thickets, from 4 to 30 ft above ground. Incubation lasts 4-11 days with eggs changing color to greenish-yellow. Young are altricial but leave nest in 7-8 days (AZGF 2002).

Although yellow-billed cuckoos usually raise their own young, they are facultative brood parasites, occasionally laying eggs in the nests of other yellow-billed cuckoos or of other bird species (USFWS 2007).

POTENTIAL TO OCCUR Yellow-billed cuckoos are unlikely to occur in the Project vicinity. Although this species was formerly widespread in the Central Valley, they are not currently thought to occur regularly in Fresno County. This is primarily due to habitat degradation and habitat loss. The large, mature tracts of riparian areas this species requires are not found within the Project vicinity, although some suitable habitat is present in the Mendota Pools area.

Appendix B.2

Special-Status Wildlife Species Descriptions

Western Burrowing Owl (*Athene cunicularia hypugea*) - SC

STATUS Burrowing owl is a Species of Special Concern in California (CDFG 2008).

DISTRIBUTION Burrowing owls are found from California east to Texas and the Dakotas, and from southern Canada south through Mexico. They are also found in Florida (Haug et al. 1993). In California, burrowing owls were formerly widespread in the state. Currently, significant populations are found in the Central Valley and the Imperial Valley, and some birds are found wintering coastally.

HABITAT Breeding habitats consist of open areas with mammal burrows including native prairie, tame pasture, hayland, fallow fields, road and railway rights-of-way, and even some urban habitats (e.g., campuses, airports, and golf courses). They use a wide variety of arid and semi-arid environments, often associated with well-drained, level to gently sloping areas characterized by very little vegetation and bare ground. When burrows are scarce however, owls have been found nesting in natural rock and lava cavities. Wintering habitats are similar (Haug et al. 1993).

LIFE HISTORY Burrowing owls are known to migrate north during March and April, although little information exists on migration routes and times. The majority of burrowing owls that breed in Canada and the northern United States are believed to migrate south during September and October spending the winter in southern parts of the United States and Mexico (Haug et al 1993).

Western burrowing owls are generally found on breeding grounds from mid-March through September. The nest is a burrow in the ground, often created and abandoned by a fossorial mammal. The owls may sometimes excavate a burrow themselves, and frequently enlarge mammal burrows for nesting purposes. Incubation lasts approximately one month. The young are able to run and forage for themselves at four weeks and achieve sustained flight at six weeks (Haug et al. 1993).

Burrowing owls are opportunistic feeders, primarily taking large insects, small mammals, birds, amphibians and reptiles. Vertebrates were more common in the winter diet and arthropods were taken more frequently during the summer months (Haug et al. 1993).

POTENTIAL TO OCCUR Burrowing owls are known to occur in the Project vicinity (Frenso Audubon 2006). Suitable grassland and agricultural habitats exist within the Project area.

Long-eared Owl (*Asio otus*) – SC

STATUS Long-eared owl is a Species of Special Concern in California (CDFG 2008).

DISTRIBUTION In the Americas, long-eared owl breeds across much of Canada south to northern Baja California, Arizona and New Mexico east to the northeastern United States. With the exception of the far north, they winter throughout much of their breeding range south into central Mexico (Marks et al. 1994). In California, they may be found throughout the state, breeding in wooded areas and wintering in deserts and the Central Valley (CDFG 2005).

HABITAT Forested habitats, particularly riparian areas, are used by Long-eared owls for nesting and roosting areas. Nesting in dense and shrubby vegetation amidst open habitats is common in the west. Foraging is done in forest openings, meadows, grasslands and desert areas (Marks et al. 1994).

LIFE HISTORY Long-eared owls often congregate in groups in winter, which may or may not be in breeding areas. Movements of this species in California are thought to be localized or of short migrations (CDFG 2005).

Appendix B.2

Special-Status Wildlife Species Descriptions

First clutches are usually laid mid-Mar to mid-May. Eggs hatch from late March through June, with young leaving nest between April and June. Nests are usually old corvid or hawk nests, up to 8 m above ground (Marks et al 1994).

Small mammals are the most common prey taken by long-eared owls, although they will also feed on passerine birds (Marks et al 1994).

POTENTIAL TO OCCUR May potentially occur as a migrant or winter resident. Suitable open habitats and dense groves of trees exist within the Project area. Unlikely to occur as a breeder.

Short-eared Owl (*Asio flammeus*) - SC

STATUS Short-eared owl is a Species of Special Concern in California (CDFG 2008).

DISTRIBUTION In North America, this widespread species occurs from north of the Arctic Circle south through the United States into central Mexico (Wiggins et al. 2006).

In California, breeding areas include the San Francisco Bay Delta, the Modoc Plateau, Great Basin habitat east of the Sierra Nevada mountain range and the San Joaquin Valley. In winter, short-eared owls are more widespread (CDFG 2005).

HABITAT In the breeding season, short-eared owls typically occupy large expanses of prairie and coastal grasslands, heathlands, shrub-steppe, tundra and agricultural areas. In winter, owls may use wetlands, stubble fields, shrublands and other open areas in addition to habitats used during the breeding season (Wiggins et al. 2006).

LIFE HISTORY Spring migrants generally arrive on breeding grounds in April. Egg-laying usually begins in April for short-eared owls. Nests are built on the ground, concealed by tall grasses and other herbaceous growth. Incubation in most areas lasts 30 days or less, and young fledge approximately 27 days after hatching (Wiggins et al. 2006). Fall migrants arrive in California in September and October (CDFG 2005).

Small mammals, particularly *Microtus* spp., are dominant prey throughout most of North America for short-eared owls. Birds are eaten as well (CDFG 2005).

POTENTIAL TO OCCUR Short-eared owls are known to occur within the Project area. Suitable wetland and grassland habitats exist within the Project area, which is within the species' known distribution.

Little Willow Flycatcher (*Empidonax traillii brewsteri*) – CE

STATUS *E. t. brewsteri* is listed as Endangered in California (CDFG 2008).

DISTRIBUTION Willow flycatchers breed from southern Canada south to southern Arizona and New Mexico, and patchily from Oregon and Washington east to New England. Several subspecies occur regularly in California. They are patchily distributed in California, with *E. t. brewsteri* being found primarily in the Sierra Nevada/Cascade region, *E. t. extimus* in southern California and *E. t. adastus* breeding east of the Cascades and the Sierras. Migrants in central California are likely the *E. t. brewsteri* or *E. t. adastus* subspecies. In winter, willow flycatchers are found in Central and South America (Sedgwick 2000).

HABITAT In California, willow flycatchers restricted to thickets of willows for breeding, whether along streams in broad valleys, in canyon bottoms, around mountain-side seepages, or at the margins of ponds and lakes. Breeding habitats and areas used as migration stopover sites are

Appendix B.2

Special-Status Wildlife Species Descriptions

similar, although willow flycatchers may use a broader range of riparian and forested habitats in migration (Sedgwick 2000).

LIFE HISTORY Willow flycatchers are late migrants and do not arrive at breeding sites in California until May. Eggs are laid in late May and early June, and young fledge anytime between late June and August. Nests are constructed low in the crotches of shrubs or small trees close to the ground. Fall migration in California is heaviest between mid-August and mid-September (Sedgwick 2000).

Willow flycatchers feed primarily on insects (Sedgwick 2000).

POTENTIAL TO OCCUR Suitable habitat is present to support migrant individuals. Although potential breeding habitat may be found in the Mendota Pools area, it is unlikely willow flycatchers would occur as a breeder. There have been no recent breeding records of little willow flycatcher from the Sacramento-San Joaquin Valleys (Sedgwick 2000).

Loggerhead Shrike (*Lanius ludovicianus*) - SC

STATUS Loggerhead shrike is a Species of Special Concern in California (CDFG 2008).

DISTRIBUTION Loggerhead shrikes are distributed widely in the United States, although they are currently absent from many areas in the northeast. In California they are widespread as well, although they are absent from the heavily forested areas in the northwestern part of the state and in higher elevations of the Sierra Nevada (CDFG 2005).

HABITAT Open country with short vegetation: pastures with fence rows, old orchards, mowed roadsides, cemeteries, golf courses, agricultural fields, riparian areas, wetlands and open woodlands are all used by loggerhead shrikes. Breeders usually settle near isolated trees or large shrubs. Resident Loggerhead Shrikes use the same habitats all year (CDFG 2005).

LIFE HISTORY Loggerhead shrikes can be found in California year-round, although this species is a short-distance migrant. In California, the breeding season lasts from March to August. Nests can be just a foot above ground, up to 50 ft above ground in shrubs or trees (CDFG 2005). Incubation lasts 16 days. In California, young fledge 20 days after hatching. Territories may be defended year-round by resident birds (CDFG 2005). In winter, shrikes are more common due to an influx of migrants from other areas.

Shrikes feed on Arthropods, amphibians, small to medium-sized reptiles, small mammals and birds, as well as roadkills and carrion. Larger prey items are impaled on thorns and barbs in order to aid in immobilization (CDFG 2005).

POTENTIAL TO OCCUR Loggerhead shrikes are known to occur within the Project area. Several were observed on a site visit in February, 2008. Suitable open habitats that this species prefers exist within the Project area.

Least Bell's Vireo (*Vireo belli pusillus*) – FE/CE

STATUS Least Bell's Vireo is a Federally Endangered Species and listed as Endangered by the State of California (CDFG 2008).

DISTRIBUTION Bell's vireos breed from coastal southern California east to Texas, then north through the Great Plains region to South Dakota and Indiana. They winter in Mexico and Central America (Brown 1993).

The Least Bell's Vireo breeds in California and northern Baja California, Mexico. This species was formerly one of the most abundant riparian birds in California, found throughout the Central

Appendix B.2

Special-Status Wildlife Species Descriptions

Valley, the Sierran foothills, the central and southern California coast and scattered desert oases. By the early 1980's they had been extirpated from much of their northern range in California, from Tehama County south through the Sacramento and San Joaquin Valleys. Least Bell's vireos are currently found in scattered locations in southern California south of the Tehachapi Mountains, Northern Baja California, and along the Salinas and Amargosa Rivers. Recovery efforts have led to some recent northward range expansion, recolonizing formerly occupied habitat in Ventura and Riverside Counties. It is possible that if population increases continue, birds may eventually occupy habitat even further north than their current range (USFWS 1998).

HABITAT Breeding habitat consists of dense, low, shrubby vegetation, generally early successional stages in riparian areas, brushy fields, young second-growth forest or woodland, scrub oak, coastal chaparral, and mesquite brushlands, often near water in arid regions. Bell's vireos may nest in any successional stage with dense understory vegetation. The most critical structural component of Least Bell's Vireo habitat in California is a dense shrub layer 0.6–3.0 m above ground (Brown 1993). Least Bell's vireos will also incorporate bordering upland habitat into breeding territories (USFWS 1998).

Little information is available for habitat at migration stopover sites. It is thought to generally consist of coastal scrub, riparian, and woodland habitats (Brown 1993).

LIFE HISTORY Spring migrants begin arriving in mid-March. Nests are typically constructed in the fork of a shrub or a tree within 1 m of the ground. Nests are highly susceptible to brood parasitism by brown-headed cowbirds, which is a major factor in their decline in California. Least Bell's vireos may be present on breeding grounds until late September, although they may begin their southbound migration as early as late July (USFWS 1998).

Insects and small spiders are the main foods taken during the breeding season by Least Bell's vireos (Brown 1993).

POTENTIAL TO OCCUR Once common in the San Joaquin Valley, Least Bell's vireos have been extirpated since at least the early 1980's as a result of habitat loss and brood parasitism by cowbirds (Brown 1993). Some potential riparian habitat may be located in the Mendota Pools area, but it is unlikely that this species would occur here in the foreseeable future, despite some recent northward range expansion.

Bank Swallow (*Riparia riparia*) – CT

STATUS Bank swallow is listed as a Threatened Species by the State of California (CDFG 2008).

DISTRIBUTION Bank swallows are widely distributed as breeders across Alaska, Canada, and the middle and higher latitudes of the United States. Bank swallows winter primarily in South America, where range extends almost the entire length of the continent south to n. and central Chile and n. Argentina. This species is also a fairly common winter resident along Pacific slope of southern Mexico (Garrison 1999).

In California, bank swallows are patchily distributed. Some currently occupied breeding areas are in the Mono Basin, Del Norte County, Siskiyou County, Shasta County, Modoc County, Lassen County, San Mateo County, San Francisco County, Ventura County and along the Sacramento and Feather Rivers. Migrants may potentially occur throughout the state, and some birds are found in winter in southeastern California (Garrison 1998).

HABITAT Presently breeds primarily in lowland areas along ocean coasts, rivers, streams, lakes, reservoirs, and wetlands. Vertical banks, cliffs, and bluffs in alluvial, friable soils characterize nesting-colony sites throughout North America. Nesting colonies also found in artificial sites such as sand and gravel quarries and road cuts (Garrison 1999).

Appendix B.2

Special-Status Wildlife Species Descriptions

Most rivers and streams with nesting habitats are low-gradient, meandering waterways with eroding streamside banks. Foraging habitats surrounding nesting colony include wetlands, open water, grasslands, riparian woodlands, agricultural areas, shrublands, and occasionally upland woodlands. During migration, this species uses a variety of open and water-associated habitats (Garrison 1999).

LIFE HISTORY Bank Swallows arrive on their breeding grounds in California beginning in late March and early April, and the bulk of breeding birds arrive in late April and early May. Nesting colonies are generally located in tall, vertical banks in friable soils along rivers, streams, lakes, and ocean coasts, where birds may excavate burrows to nest in. Eggs are laid in April and May. Birds vacate their breeding grounds as soon as juveniles begin dispersing from the colonies around late June and early July. The fall migration period moves south through the state from early August to mid-September (Garrison 1998).

The Bank Swallow forages predominantly on flying or jumping insects that it captures almost exclusively on the wing (Garrison 1998).

POTENTIAL TO OCCUR Bank swallows are known to occur in the project vicinity. A colony of 30 birds was observed at the Mendota Pool in 1980. Suitable foraging habitat exists in the project area and suitable nesting habitat may still be present in the project vicinity.

Yellow Warbler (*Dendroica petechia brewsteri*) – SC

STATUS The *brewsteri* subspecies of yellow warbler is listed as a Species of Special Concern in California (CDFG 2008).

DISTRIBUTION Yellow warblers breed from Alaska east to Newfoundland, throughout much of the United States south into Mexico. A few individuals winter in California, but most winter from Mexico south into South America (Lowther et al 1999).

The *brewsteri* subspecies is found in Washington, Oregon and California. In California, *D. p. brewsteri* breeds along the coast along the length of the state, as well as inland in northern California on the east side of the Central Valley and in the Sierran foothills (Dunn and Garrett 1997).

HABITAT Yellow warblers breed most commonly in wet, deciduous thickets, especially those dominated by willows, and in disturbed and early successional habitats. In migration, this species uses mainly scrub and shrub habitats and semiopen, second-growth forest, often associated with wetlands. Spring and fall migrants concentrated in same habitats most frequently used for breeding (Lowther et al 1999).

LIFE HISTORY In California, spring migrants begin arriving in late March and early April. Egg-laying begins in mid to late May. The nest is built in an upright fork of bush, sapling, or tree up to 50 ft above ground but very low to the ground. Fall migration begins as early as late July and runs through September (Lowther et al 1999).

Insects and other small arthropods are the main foods taken (Lowther et al 1999).

POTENTIAL TO OCCUR Suitable riparian habitat is available for migrant yellow warblers. Potential breeding habitat can be found in the riparian areas in the Mendota Pools area.

Yellow-breasted Chat (*Icteria virens*) – SC

STATUS Yellow-breasted chats are a Species of Special Concern in California (CDFG 2008).

DISTRIBUTION Chats breed from across the United States north to extreme southern Canada, although they are largely absent from the Great Plains region. They winter from Mexico south to

Appendix B.2

Special-Status Wildlife Species Descriptions

Panama (Eckerle and Thompson 2001). In California, they are found throughout much of northern California, the Central Valley, and in scattered areas with appropriate habitat in southern California (Dunn and Garrett 1997).

HABITAT In the west, chats use riparian and shrubby habitats with low, dense vegetation during migration and breeding (Eckerle and Thompson 2001).

LIFE HISTORY In California, spring migrants begin arriving in mid-April. Birds become very secretive and difficult to detect on breeding grounds by mid-July and migrate south in August and September. Data on egg-laying dates for chats is limited; chats in California likely lay clutches in early and mid-May. Nests are constructed in low, dense vegetation up to 1 m above ground (Eckerle and Thompson 2001).

Chats mainly feed on insects and spiders, although fruits and berries may be taken when available (Eckerle and Thompson 2001).

POTENTIAL TO OCCUR Riparian habitat in the Mendota Pools area and along the San Joaquin River may support yellow-breasted chats.

Oregon Vesper Sparrow (*Pooecetes gramineus affinis*) - SC

STATUS Oregon vesper sparrow is a Species of Special Concern in California (CDFG 2008).

DISTRIBUTION Vesper Sparrows breeds across southern Canada, south to California and east to North Carolina. They winter across the southern United States into Mexico (Sibley 2000).

This subspecies breeds from Del Norte County in northwestern California to southern British Columbia. It winters in the Central Valley, south to Baja California (Jones and Cornely 2002).

HABITAT Wintering habitat is similar to other vesper sparrow subspecies that winter in California. Open country habitats such as croplands, shrublands and brushlands are used in winter (CDFG 2005).

LIFE HISTORY Relatively little information is available on this subspecies of vesper sparrow. It's basic ecology is likely similar to other subspecies. In California, vesper sparrows arrive on wintering grounds in September and October and leave by March or April (CDFG 2005). This subspecies does not nest in the Central Valley.

The annual diet of vesper sparrows is about half insects and spiders, and half grass and forb seeds. Insects and spiders are especially important in breeding season. Vesper sparrows glean from ground and herbage (CDFG 2005).

POTENTIAL TO OCCUR Oregon vesper sparrows may potentially occur within the Project vicinity. Suitable grassland and agricultural habitats are available and the Project vicinity is within the known distribution.

Tricolored Blackbird (*Agelaius tricolor*) – CSC

STATUS The tricolored blackbird is a California species of special concern (CDFG 2008).

DISTRIBUTION Tricolored blackbirds are mostly limited to California, with a few breeding colonies located in Oregon (Sibley 2000). This blackbird ranges throughout the Central Valley of California.

HABITAT An adequate breeding ground for the tricolored blackbird requires open water, protected nesting substrate, and a foraging area with insect prey within a few miles of the colony. Foraging habitat for this species in all seasons includes pastures, agricultural fields, and dry

Appendix B.2

Special-Status Wildlife Species Descriptions

seasonal pools; with occasional foraging ground in riparian scrub, marsh borders, and grassland habitats.

LIFE HISTORY Tricolored blackbirds typically leave their wintering areas in late March and early April for breeding locations in Sacramento County, and throughout the San Joaquin Valley. This species typically nests in colonies numbering several hundred (CDFG 2005).

Insects (e.g., beetles, caterpillars) comprise a large portion of the diet. Tricolored blackbirds feed on seeds and grain in fall and winter (NatureServe 2008).

POTENTIAL TO OCCUR Tricolored blackbirds are known to occur in the Project vicinity (Fresno Audubon Society 2006, National Audubon Society 2004). Suitable wetland and agricultural habitats exist within the Project area.

Yellow-headed blackbird (*Xanthocephalus xanthocephalus*) - SC

STATUS Yellow-headed blackbird is a Species of Special Concern in California (CDFG 2008).

DISTRIBUTION This species breeds in the western U.S. and Canada, south to southern California, Arizona and Texas. Wintering birds can be found in the southwestern U.S. south into Mexico (Twedt and Crawford 1995).

In California, this species breeds commonly, but locally, east of Cascade Range and Sierra Nevada, in the Imperial and Colorado River Valleys, and fairly commonly in the Central Valley. It has limited distribution in Central Valley in winter (CDFG 2005).

HABITAT During the breeding season, this species primarily occupy prairie wetlands, but also common in wetlands associated with parklands, mountain meadows, and arid regions. Nests are located in emergent vegetation of deep-water palustrine wetlands. Yellow-headed blackbirds forage within wetlands and surrounding grasslands, croplands, or savanna. Postbreeding birds forage mostly in cropland and grassland and may range several Km before returning to wetland roosts at dusk (Twedt and Crawford 1995).

In winter and migration, they forage in open agricultural areas such as harvested grain fields, plowed fields, meadows, and pastures. This species uses emergent vegetation in wetlands for night roosts and loafs during the day in wetland vegetation, shrubby vegetation, and small woodlots (Twedt and Crawford 1995).

LIFE HISTORY Adults begin arriving on breeding grounds in April. Egg-laying begins in May. Incubation lasts up to 14 days, and chicks leave the nest 9-14 days after hatching. Birds begin departing from breeding grounds in August (Twedt and Crawford 1995).

Most nests attached to cattails, bulrushes, and reeds but also built in willows (*Salix* spp.), tamarix (*Tamarix gallica*), and rarely in wild rice (*Zizania aquatica*). Nest sites are located over water. These nests are generally less than 3 ft above the water (Twedt and Crawford 1995).

Adult feeds primarily on seeds and cultivated grains; eats insects in breeding season. In Sacramento Valley, insect consumption reached a peak of 20 percent in summer. Young fed mostly insects, some spiders and snails. Feeds in emergent vegetation, along moist shorelines, and in nearby grasslands and croplands, preferably near water or on moist ground. Often hawks flying insects (CDFG 2005).

POTENTIAL TO OCCUR Yellow-headed blackbirds are known to occur in the Project vicinity. Suitable wetland and agricultural habitats exist within the Project area.

Appendix B.2

Special-Status Wildlife Species Descriptions

MAMMALS

Western Red Bat (*Lasiurus blossevilli*) - SC

STATUS Western red bat is considered a species of special concern in California (CDFG 2008).

DISTRIBUTION Western red bats are found from British Columbia south throughout South America. In the United States, they are a western species and occur in Oregon, California, Nevada, Utah, Arizona and New Mexico (Natureserve 2008, Burt 1980).

HABITAT Rivers and streams and associated riparian habitats, mesquite bosques and desert washes (NDOW 2007), rarely in desert habitats (Natureserve 2008). Summer roost sites are in tree foliage. Bats avoid caves and buildings much of the year (Natureserve 2008). In Arizona, they are a mid-elevational species and are found from 2400-7200 ft (AZGF 2003).

LIFE HISTORY Breeding occurs in late summer and early fall. Females may store sperm until spring, when eggs are fertilized. Gestation lasts up to 80 days and is followed by the birth of one to five young in May or June (AZGF 2003, Natureserve 2008). Young are usually weaned in July (Natureserve 2008). Offspring may forage with females (AZGF 2003).

Western red bats feed primarily on moths, beetles and flying ants. Ground-dwelling crickets are also taken (AZGF 2003).

Bats in northern populations may migrate south for the winter or may hibernate. In the southwest they are thought to be migratory and have only been documented from April to September (AZGF 2003). Seasonal dispersal in California individuals is limited. Western red bats winter along the California coast and move to inland locations in summer (Natureserve 2008).

POTENTIAL TO OCCUR Western red bats are known to occur within the Project vicinity. Suitable woodland and open habitats exists within the Project vicinity.

Western Mastiff Bat (*Eumops perotis californicus*) - SC

STATUS Western Mastiff Bat has been designated as a Species of Special Concern in California (CDFG 2008).

DISTRIBUTION Western mastiff bat is found from California east to Texas and south to Cuba and Argentina. In California, this species is found from Butte County south. Populations in California are thought to remain in the state year-round (Jameson and Peeters 2004).

HABITAT Western mastiff bats use many open, semi-arid to arid habitats, including conifer and deciduous woodlands, coastal scrub, annual and perennial grasslands, palm oases, chaparral, desert scrub, and urban. Crevices in cliff faces, high buildings, trees, and tunnels are required for roosting. When roosting in rock crevices, this species needs vertical faces to drop off to take flight (CDFG 2005).

LIFE HISTORY This species generally goes into daily torpor from December through February, but usually resumes activity each night to feed, except when temperatures drop below 5° C (41 ° F) (CDFG 2005).

Mating takes place in early spring, and young are born between late June and September (Jameson and Peeters).

This bat feeds on strong flying insects such as dragonflies, moths, beetles and hymenopterans (Jameson and Peeters 2004).

POTENTIAL TO OCCUR Western mastiff bat is known to occur within the Project vicinity. Suitable roosting sites and foraging habitat exists within the Project area.

Appendix B.2

Special-Status Wildlife Species Descriptions

Townsend's Big-eared Bat (*Corynorhinus townsendii*) - SC

STATUS Townsend's big-eared bat is a Species of Special Concern in California (CDFG 2008).

DISTRIBUTION This species occurs throughout California, with the exception of the high Sierras (CDFG 2005).

HABITAT This species is found in all but subalpine and alpine habitats, being most abundant in mesic areas. It requires caves, mines, tunnels, buildings, or other human-made structures for roosting. Hibernation sites are cold, but not below freezing. Maternity roosts are warm (CDFG 2005).

LIFE HISTORY This species is not considered highly migratory, and is found in California throughout the year. Maternity roosts are found in caves, tunnels, mines, and buildings. Small clusters or groups (usually fewer than 100 individuals) of females and young form the maternity colony. Females give birth in May and June, and young can fly 3 weeks after being born. Maternity groups break up in August. This species is very sensitive to disturbance at roost sites (CDFG 2005).

Townsend's big-eared bats prey primarily on moths (CDFG 2005).

POTENTIAL TO OCCUR Townsend's big-eared bats may potentially occur. Suitable roosting sites and foraging habitat are located in the Project vicinity.

Tulare Grasshopper Mouse (*Onychomys torridus tularensis*) - SC

STATUS Tulare grasshopper mouse is a Species of Special Concern in California (CDFG 2008).

DISTRIBUTION The Tulare grasshopper mouse historically ranged from about western Merced and eastern San Benito Counties east to Madera County and south to the Tehachapi Mountains; on the east, they ranged from Madera County south. Currently, Tulare grasshopper mice are known to occur along the western margin of the Tulare Basin, including western Kern County, Carrizo Plain Natural Area, along the Cuyama Valley side of the Caliente Mountains, San Luis Obispo County, and the Ciervo-Panoche Region, in Fresno and San Benito Counties (USFWS 1998).

HABITAT Tulare grasshopper mice typically inhabit arid shrubland communities in hot, arid grassland and shrubland associations. There is little information about the habitat requirements of the Tulare subspecies. Habitats recorded in the literature include Upper Sonoran Subshrub Scrub and alkali sink, dominated by one or more saltbush species, iodine bush, seepweed, and pale-leaf goldenbush; mesquite associations on the Valley floor; saltbush scrub; Upper Sonoran shrub associations dominated by California ephedra/Anderson desert thorn; and grassland associations (primarily Arabian grass and red brome) on the sloping margins of the San Joaquin Valley and the Carrizo Plain region (USFWS 1998).

LIFE HISTORY Specific information on the reproduction and the mating system of Tulare grasshopper mice is unknown. The nest of the southern grasshopper mouse is typically located in a burrow system that may have been abandoned by another small mammal. For southern grasshopper mice in general, breeding occurs throughout the year in laboratory settings, but is seasonal in natural populations. Most litters are born from May through July, with a sharp decline in August (USFWS 1998).

Tulare grasshopper mice are nocturnal and active year round. They probably do not become dormant, at least not for long periods, though in captivity individuals have exhibited short episodes of torpor (USFWS 1998).

Appendix B.2

Special-Status Wildlife Species Descriptions

Southern grasshopper mice eat mostly small animals, with insects forming the bulk of their diets. Prey items include scorpions, beetles, grasshoppers, pocket mice, and western harvest mice. They also eat seeds. Captive grasshopper mice stored sunflower seeds in their nest boxes during the winter months; which was used only when no other food source was available (USFWS 1998).

POTENTIAL TO OCCUR Tulare grasshopper mouse is known to occur within the Project vicinity. Suitable grassland and scrub habitats exist within the Project area.

Giant Kangaroo Rat (*Dipodomys ingens*) - FE/CE

STATUS Giant kangaroo rat is listed as a federally endangered species and endangered by the State of California (CDFG 2008).

DISTRIBUTION This species is confined to southern and central California, including Fresno, Kern, Kings, San Benito, San Luis Obispo, Santa Barbara counties; most populations occupy relatively small areas of suitable habitat (NatureServe 2008).

HABITAT Habitat for giant kangaroo rat consists of gently sloping and level piedmont plains and areas supporting saltbush and perennial grasses. Often, suitable habitat is now dominated by introduced annuals, with many shrubs in some areas. The species occupies areas of sparse vegetative cover and well-drained soils, often in areas that are heavily grazed by cattle and sheep. This kangaroo rat prefers semi-arid slopes at the head of draws in barren shrubless areas, with loose, easily diggable, sandy loam soils. When inactive, it occupies underground burrows. They may utilize fallow dry-land grain fields if there are colonies on uncultivated land nearby (USFWS 1998).

LIFE HISTORY This species is nocturnal. Limited data indicate that the reproductive season may extend from January through May or February to June or perhaps later. Young are born in burrows. Gestation lasts about 1 month. Young are weaned at 4 weeks (USFWS 1998).

In spring, areas around occupied burrows have a more lush growth of herbaceous vegetation than do areas between burrow systems; this growth is eventually removed by grazing by livestock and/or kangaroo rats (USFWS 1998).

This species feeds primarily on seeds, especially those of *Lepodyum nitidum*, *Oenothera* spp., *Bromus rubens* and *Erodium cicutarium*. Giant kangaroo rat also eats some green herbaceous vegetation and occasionally insects. In some localities, they gather dry grass into "haystacks" to cure, later removing seeds for storage in underground burrows (USFWS 1998).

POTENTIAL TO OCCUR Giant kangaroo rat may occur within the Project vicinity, although the closest known populations are in the Panoche Hills region to the west. Suitable grassland and scrub habitats exist within the Project area.

Short-nosed Kangaroo Rat (*Dipodomys nitratooides brevinasus*) - SC

STATUS Short-nosed Kangaroo Rat is considered to be a species of special concern in California (CDFG 2008).

DISTRIBUTION The historical geographic range of short-nosed kangaroo rats is only partly known from museum and literature records and recent studies at a few sites. Short-nosed kangaroo rats occupied suitable habitat along the western half of the Valley floor and hills on the western edge of the Valley from about Los Banos, Merced County, south to the foothills of the Tehachapi Range and extending east and northward inland above the edge of the Valley floor to about Poso Creek, north of Bakersfield. They also occurred on the Carrizo Plain and the upper

Appendix B.2

Special-Status Wildlife Species Descriptions

Cuyama Valley. Current occurrences are incompletely known. Populations mostly are small, fragmented, and widely scattered. Recent large-scale survey and trapping efforts include: the Panoche Region of Fresno and San Benito Counties; Cantua Creek, Fresno County; the Kettleman Hills, Kings County; western Kern County; Carrizo Plain Natural Area; and Cuyama Valley. Populations are known from around the edge of Pleasant Valley (Coalinga area), Fresno County; a few, scattered spots in Kings and Kern Counties; the Carrizo Plain Natural Area; and the Caliente Mountains at the north edge of the Cuyama Valley (USFWS 1998).

HABITAT Short-nosed kangaroo rats historically were found mostly on flat and gently sloping terrain and on hilltops in desert-shrub associations, primarily saltbushes and California ephedra (USFWS 1998).

Short-nosed kangaroo rats generally occupy grassland with scattered shrubs and desert-shrub associations on friable soils. They inhabit highly saline soils around Soda Lake, on the Carrizo Plain, and less saline soil elsewhere. Over most of their current range they are generally more numerous in lighter, friable soils such as the sandy bottoms and banks of arroyos and other sandy areas (USFWS 1998).

LIFE HISTORY Short-nosed kangaroo rats are nocturnal and active year round. They do not become dormant. They frequently appear above ground shortly after sunset and before dark (USFWS 1998).

Short-nosed kangaroo rats have essentially the same diet and foraging behavior as the other subspecies of the San Joaquin kangaroo rat, feeding on seeds, green vegetation and some insects (USFWS 1998).

The reproductive season at higher elevations, such as on the Carrizo Plain Natural Area, is about 2 to 3 months shorter than on the Valley floor, with estrus commencing in late February or March and ending by May most years, though reproduction may continue through August in years with a prolonged wet spring. Like other subspecies of the San Joaquin kangaroo rat, populations of the short-nosed kangaroo rat undergo dramatic population fluctuations, and sometimes disappear from an area (USFWS 1998).

POTENTIAL TO OCCUR Short-nosed kangaroo rat may potentially occur within the Project vicinity. Several populations of short-nosed kangaroo rat are known in Fresno County, and suitable grassland and shrub habitats exist within the Project area.

Fresno Kangaroo Rat (*Dipodomys nitratooides exilis*) - FE/CE

STATUS Fresno kangaroo rat is listed as a federally endangered species and an endangered species by the State of California (CDFG 2008).

DISTRIBUTION The known historical geographic range of the Fresno kangaroo rat encompassed an on the San Joaquin Valley floor, from about the Merced River, Merced County, on the north, to the northern edge of the marshes surrounding Tulare Lake, Kings County, on the south, and extending from the edge of the Valley floor near Livingston, Madera, Fresno, and Selma, westward to the wetlands of Fresno Slough and the San Joaquin River. Documentation of historical distribution is scanty (USFWS 1998).

There are currently no known extant populations of Fresno kangaroo rat. The last documented record was of a single male captured in autumn 1992 on the Alkali Sink Ecological Reserve, west of Fresno. Subsequent trapping at this site and in other areas with suitable habitat have failed to document any other individuals. Lack of access to some sites due to private property as inhibited survey efforts (USFWS 1998).

Appendix B.2

Special-Status Wildlife Species Descriptions

HABITAT Fresno kangaroo rats occupy sands and saline sandy soils in chenopod scrub and annual grassland communities on the Valley floor. Recently they have been found only in alkali sink communities between 61 to 91 m (200 to 300 ft) in elevation. Topography is often nearly level, consisting of bare alkaline clay-based soils subject to seasonal inundation and are broken by slightly rising mounds of more crumbly soils, which often accumulate around shrubs or grasses. Associated plant species include seepweed, iodine bush, saltbushes, peppergrass, filaree, wild oats, and mouse-tail fescue (USFWS 1998).

LIFE HISTORY Nothing is known about mating behavior or the mating system of Fresno kangaroo rats in the wild, although some studies of captive individuals have been made (USFWS 1998).

Fresno kangaroo rats shelter in ground burrows that are dug by them or their predecessors. Burrows usually are found in relatively light, crumbly soils in raised areas. Pregnant female Fresno kangaroo rats have been taken between February and March and June and September. Pregnancies between June and September might represent second or third litters for adult females, summer breeding by young females born in the spring, or both (USFWS 1998).

Breeding probably is initiated in winter after onset of the rainy season. In captivity, gestation was 32 days and young were weaned at 21 to 24 days. Young are born in the burrow, probably within a nest of dried, shredded vegetation. Culbertson (1946) believed that young Fresno kangaroo rats were not found out of the burrow and foraging for themselves until about 6 weeks old, similar to estimates for Tipton and short-nosed kangaroo rats (USFWS 1998).

Fresno kangaroo rats are nocturnal and active year round (USFWS 1998).

Seeds are a staple in their diet, but they also eat some types of green, herbaceous vegetation, and insects. Seeds of woody shrubs, especially saltbrushes, may be an important food source. Insects make up a small part of the diet. In fall and winter, after the wet season commences, sprouts of seeds and tender new growth of grasses and forbs may be essential items in the diet of Fresno kangaroo rats (USFWS 1998).

POTENTIAL TO OCCUR Fresno kangaroo rat is known to occur within the Project vicinity. However, it is unknown if this subspecies is still extant, as none have been documented since 1992.

Nelson's Antelope Squirrel (*Ammospermophilus nelsoni*) - CT

STATUS Nelson's antelope squirrel is listed as a threatened species by the state of California (CDFG 2008).

DISTRIBUTION This species is endemic to California. It occurs in the San Joaquin Valley and neighboring valleys, including areas in Fresno, Kern, Kings, San Benito, San Luis Obispo, Santa Barbara and Tulare Counties, most commonly below 800 m on the ridges and plains west of the San Joaquin Valley proper. Populations now exist primarily in marginal habitats of low foothills and mountains on the western edge of the San Joaquin Valley; significant populations occur only in western Kern County at Elk Hills and on portions of the Carrizo and Elkhorn plains. In the northern part of its range, low density populations occur in the Panoche and Kettleman hills (USFWS 1998).

HABITAT Habitat consists of dry flat or rolling terrain, on alluvial and loamy soils, soils with sandy or gravelly texture, or fine-grained soils that are nearly brick-hard when dry. The species inhabits grassy, sparsely shrubby ground. These shrubs include saltbush, ephedra, bladder pod, goldenbush and snakeweed. It also occurs in areas lacking shrubs where giant kangaroo rats are present. Habitats that are avoided include valley floor areas of alkaline soils, iodine bush, and spring saltbush, probably due to high water tables (USFWS 1998).

Appendix B.2

Special-Status Wildlife Species Descriptions

LIFE HISTORY The breeding season coincides with availability of green vegetation. Young are born in March, first seen above ground about the first week of April, at which time they gather food (USFWS 1998)

These squirrels seldom dig their own burrows, most often using burrows made by other small mammals. Preferred burrow locations are under shrubs, in the banks of arroyos at the base of alluvial fans, and along roadcuts, pipelines, and drilling platforms (USFWS 1998).

This species generally stays underground when air temperature is less than 10 C. Little activity in hot weather, when most active in morning and late afternoon. There is no evidence of hibernation or estivation in this species; however they may disappear from the surface during the hottest months of the year (USFWS 1998).

Nelson's antelope ground squirrel is omnivorous. Its diet consists mainly of green vegetation, grass and forb seeds, and insects. Filaree (*Erodium cicutarium*) and red brome (*Bromus rubens*) are reported to be important food items. Nelson's antelope ground squirrel feeds on insects during the dry season, from mid-April to December. Green vegetation is an important food source from December to April (USFWS 1998).

POTENTIAL TO OCCUR Nelson's antelope ground squirrel is known to occur within the Project vicinity. Suitable grassy areas with sparse shrubs are present in the Project area.

San Joaquin Kit Fox (*Vulpes macrotis mutica*) - FE/CT

STATUS San Joaquin kit fox is listed as a Federally Endangered Species and Threatened by the State of California (CDFG 2008).

DISTRIBUTION This subspecies of kit fox is endemic to California. Prior to 1930, kit foxes inhabited most of the San Joaquin Valley from southern Kern County north to Tracy, San Joaquin County, on the west side, and near La Grange, Stanislaus County, on the east side.

Kit foxes currently inhabit some areas of suitable habitat on the San Joaquin Valley floor and in the surrounding foothills of the coastal ranges, Sierra Nevada, and Tehachapi Mountains, from southern Kern County north to Contra Costa, Alameda, and San Joaquin Counties on the west, and near La Grange, Stanislaus County on the east side of the Valley, and some of the larger scattered islands of natural land on the Valley floor in Kern, Tulare, Kings, Fresno, Madera, and Merced Counties. Kit foxes also occur westward into the interior coastal ranges (USFWS 1998).

HABITAT Historically, San Joaquin kit foxes occurred in several native plant communities of the San Joaquin Valley which are represented by small, degraded remnants today. Currently, occupied habitats include grasslands and scrublands with active oil fields, wind turbines, and an agricultural matrix of row crops, irrigated pasture, orchards, vineyards, and grazed annual grasslands (nonirrigated pasture). Other plant communities in the San Joaquin Valley providing kit fox habitat include Northern Hardpan Vernal Pool, Northern Claypan Vernal Pool, Alkali Meadow, and Alkali Playa (USFWS 1998).

Kit foxes use some types of agricultural land where uncultivated land is maintained, allowing for denning sites and a suitable prey base. Kit foxes also den on small parcels of native habitat surrounded by intensively maintained agricultural lands, and adjacent to dryland farms (USFWS 1998).

Kit foxes prefer loose-textured soils, but are found on virtually every soil type. Dens appear to be scarce in areas with shallow soils because of the proximity to bedrock, high water tables, or impenetrable hardpan layers. However, kit foxes will occupy soils with a high clay content where they modify burrows dug by other animals (USFWS 1998).

Appendix B.2

Special-Status Wildlife Species Descriptions

LIFE HISTORY San Joaquin kit foxes are primarily active at night (i.e., nocturnal), and active throughout the year. Adults and pups sometimes rest and play near the den entrance in the afternoons, but most above-ground activities begin near sunset and continue sporadically throughout the night (USFWS 1998).

San Joaquin kit foxes use dens for temperature regulation, shelter from adverse environmental conditions, reproduction, and escape from predators. Kit foxes also modify and use dens constructed by other animals, such as ground squirrels, badgers, and coyotes, and human-made structures (culverts, abandoned pipelines, and banks in sumps or roadbeds). Kit foxes often change dens and numerous dens may be used throughout the year (USFWS 1998).

During September and October, adult females begin to clean and enlarge natal or pupping dens. Mating and conception take place between late December and March. Litters are born sometime between February and late March. After 4 to 5 months, usually in August or September, the family bonds begin to dissolve and the young begin dispersing (USFWS 1998).

The diet of kit foxes varies considerably. In the central portion of their geographic range, known prey species include white-footed mice, insects, California ground squirrels, kangaroo rats, San Joaquin antelope squirrels, black-tailed jackrabbits, and chuckar (*Alectoris chukar*) (USFWS 1998).

POTENTIAL TO OCCUR San Joaquin kit fox are known to occur within the Project vicinity. Suitable grassland and shrubby habitats exist within the Project area.

American Badger (*Taxidea taxus*) - SC

STATUS The American badger is a California species of special concern (CDFG 2008).

DISTRIBUTION Badgers are widespread in the western and central United States, north into Canada and south into Mexico. Badgers can be found throughout most of California (CDFG 2005).

HABITAT This species is both nocturnal and diurnal, and frequents drier open stages of most shrub, forest, and herbaceous habitats (CDFG 2005).

LIFE HISTORY The badger is active throughout the year in most of its range in California, except in the North Coast area where it enters variable periods of torpor in winter. Badgers dig burrows in friable soil for cover (CDFG 2005).

Badgers mate in summer and early fall with young born mostly in March and April in burrows that are usually found in areas with sparse overstory cover. Young disperse from the family group in the fall (NatureServe 2008).

Badgers eat fossorial rodents including rats, mice, chipmunks, and especially ground squirrels and pocket gophers. They also eat some reptiles, insects, earthworms, eggs, birds, and carrion. Diet shifts seasonally and yearly in response to availability of prey (CDFG 2005).

POTENTIAL TO OCCUR Badgers are known to occur within the Project vicinity. Suitable open habitats and dense groves of trees exist within the Project area.

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Appendix B.2

Table B.2-2. Special Status Animal Species Identified During the Literature Search

Scientific Name	Common Name	Status	Habitat Conditions	Potential To Occur in Project Area
<i>Branchinecta lynchi</i>	Vernal pool fairy shrimp	FT	Endemic to the grasslands of the Central Valley, Central Coast mountains, and south coast mountains, in astatic rain-filled pools. Inhabit small, clear-water sandstone-depression pools and grassed swale, earth slump, or basalt-flow depression pools.	May potentially occur; suitable habitat is present within the Project area. Spores of unidentified vernal shrimp species have been observed in the Project area.
<i>Lepidurus packardii</i>	Vernal pool tadpole shrimp	FE	Inhabits vernal pools and swales in the Sacramento Valley containing clear to highly turbid water. Pools commonly found in grass bottomed swales of unplowed grasslands. Some pools are mud-bottomed and highly turbid.	May potentially occur; suitable habitat is present within the Project area. Spores of unidentified vernal shrimp species have been observed in the Project area.
<i>Desmocerus californicus dimorphus</i>	Valley elderberry longhorn beetle	FT	Occurs only in the Central Valley of California, in association with blue elderberry (<i>Sambucus mexicana</i>). Prefers to lay eggs in elderberries 2 to 8 inches in diameter; some preference shown for "stressed" elderberries.	May potentially occur. Riparian habitat and elderberry (<i>Sambucus</i> sp.) exists within the Project area.
<i>Hypomesus transpacificus</i>	Delta smelt	FT/CT	Sacramento-San Joaquin Delta. Seasonally in Suisun Bay, Carquinez Strait and San Pablo Bay. Seldom found at salinities >10 ppt. Most often at salinities < 2ppt.	Unlikely to occur due to lack of suitable aquatic habitat; not in an area of known occurrence.
<i>Spirinchus thaleichthys</i>	Longfin smelt	SC	Euryhaline, nektonic and anadromous. Found in open waters of estuaries, mostly in middle or bottom of water column. Prefer salinities of 15-30 ppt, but can be found in completely freshwater to almost pure seawater.	Unlikely to occur due to lack of suitable aquatic habitat; not in an area of known occurrence.
<i>Pogonichthys macrolepidotus</i>	Sacramento splittail	FD (2003)/SC	Endemic to the lakes and rivers of the Central Valley, but now confined to the delta, Suisun Bay and associated marshes. Slow moving river sections, dead end sloughs. Requires flooded vegetation for spawning and foraging for young.	Unlikely to occur due to lack of suitable aquatic habitat; not in an area of known occurrence.
<i>Oncorhynchus mykiss irideus</i>	Steelhead - Central Valley ESU	FT	Populations in the Sacramento and San Joaquin Rivers and their tributaries.	Unlikely to occur due to lack of suitable aquatic habitat.

Appendix B.2

Table B.2-2. Special Status Animal Species Identified During the Literature Search

Scientific Name	Common Name	Status	Habitat Conditions	Potential To Occur in Project Area
<i>Ambystoma californiense</i>	California tiger salamander	FT/SC	Central Valley DPS listed as threatened. Santa Barbara and Sonoma Counties DPS listed as endangered. Need underground refuges, especially ground squirrel burrows and vernal pools or other seasonal water sources for breeding.	May potentially occur. Mammal burrows and ephemeral wetlands are available within the Project area.
<i>Spea hammondi</i>	Western spadefoot	SC	Occurs primarily in grassland habitats, but can be found in valley-foothill hardwood woodlands. Vernal pools are essential for breeding and egg-laying.	Known to occur in the Project vicinity. Suitable grassland and wetland habitat exists within the Project area.
<i>Rana aurora draytonii</i>	California red-legged frog	FT/SC	Lowlands and foothills in or near permanent sources of deep water with dense, shrubby or emergent riparian vegetation. Requires 11-20 weeks of permanent water for larval development. Must have access to estivation habitat.	No potential to occur, outside of current range. Largely extirpated from the Central Valley. Not discussed further.
<i>Actinemys marmorata</i>	Western pond turtle	SC	A thoroughly aquatic turtle of ponds, marshes, rivers, streams and irrigation ditches with aquatic vegetation. Need basking sites and suitable (sandy banks or grassy open fields) upland habitat for egg-laying.	Known to occur in the Project vicinity and observed within the Project area. Suitable wetland habitat is available in the Project area.
<i>Gambelia sila</i>	Blunt-nosed leopard lizard	FE/CE/FP	Resident of sparsely vegetated alkali and desert scrub habitats, in areas of low topographic relief. Seeks cover in mammal burrows, under shrubs or structures such as fence posts; they do not excavate their own burrows.	Known to occur within the Project vicinity. Suitable desert scrub habitat (i.e., valley sink scrub) exists within the Project area.
<i>Phrynosoma coronatum (frontale population)</i>	Coast (California) horned lizard	SC	Frequents a wide variety of habitats, most common in lowlands along sandy washes with scattered low bushes. Open areas for sunning, bushes for cover, patches of loose soil for burial, and abundant supply of ants and other insects.	Known to occur within the Project vicinity. Suitable grassland habitats exist within the Project area.
<i>Anniella pulchra pulchra</i>	Silvery legless lizard	SC	Sandy or loose loamy soils under sparse vegetation. Soil moisture is essential. They prefer soils with a high moisture content.	Known to occur in the Project vicinity; limited wooded and sandy habitats are available.
<i>Masticophis flagellum ruddocki</i>	San Joaquin whipsnake	SC	Open, dry habitats with little or no tree cover. Found in valley grassland and saltbush scrub in the San Joaquin Valley. Needs mammal burrows for refuge and oviposition sites.	Known to occur within the Project area. Suitable open habitats exist within the Project area.

Appendix B.2

Table B.2-2. Special Status Animal Species Identified During the Literature Search

Scientific Name	Common Name	Status	Habitat Conditions	Potential To Occur in Project Area
<i>Thamnophis gigas</i>	Giant garter snake	FT/CT	Prefers freshwater marsh and low gradient streams. Has adapted to drainage canals and irrigation ditches. This is the most aquatic of the garter snakes in California.	Known to occur within the Project vicinity. Suitable wetland habitat exists within the Project area.
<i>Anser albifrons elgasi</i>	Tule greater white-fronted goose	SC	Winters in marshes, bays, lakes, and agricultural fields. This subspecies prefers foraging in marshes rather than fields, as in other subspecies.	May potentially occur as a migrant and winter resident. Suitable marsh and agricultural habitat exists within the Project area.
<i>Branta hutchinsii leucopareia</i>	Cackling (=Aleutian Canada) goose	FD (2001)	Winters on lakes and inland prairies. Forages on natural pasture or that cultivated to grain; loafs on lakes, reservoirs, ponds.	Known to occur within the Project area as a migrant or winter resident. Suitable wetland and agricultural habitat exist within the Project area. Observed on a site visit in February, 2008. This species was delisted in 2001 and is not discussed further.
<i>Aythya americana</i>	Redhead	SC	Winters in a wide variety of saltwater and freshwater wetland habitats. Breeds in large freshwater wetlands with emergent vegetation.	May potentially occur as a breeder, migrant or winter resident. Suitable wetland habitat exists within the Project area.
<i>Bucephala islandica</i>	Barrow's goldeneye	SC	Winters on lakes, rivers, bays and estuaries in central and northern California. Possibly extirpated from nesting in the Sierra Nevadas.	May potentially occur as a migrant or winter resident. Suitable wetland habitat exists in the Project area.
<i>Pelecanus erythrorhynchos</i>	American white pelican	SC	Uses rivers, lakes, reservoirs, estuaries, bays, marshes, inshore marine habitats. Nests are usually on islands or peninsulas in brackish or freshwater lakes, isolated from mammalian predators. Nests in California, formerly nested in Central Valley.	Known to occur in the Project area as a migrant or winter resident. Suitable wetland habitat exists in the Project area. Observed within the Project area in February, 2008.
<i>Plegadis chihi</i>	White-faced ibis	formerly SC	Shallow fresh-water marsh, dense tule thickets for nesting interspersed with areas of shallow water for foraging.	An SC species until February, 2008; currently not a special status species. Not discussed further.
<i>Pandion haliaetus</i>	Osprey	formerly SC	Ocean shore, bays, fresh-water lakes, and larger streams. Large nests built in tree-tops within 15 miles of a good fish-producing body of water.	An SC species until February, 2008; currently not a special status species. Not discussed further.

Appendix B.2

Table B.2-2. Special Status Animal Species Identified During the Literature Search

Scientific Name	Common Name	Status	Habitat Conditions	Potential To Occur in Project Area
<i>Elanus leucurus</i>	White-tailed kite	FP	Rolling foothills and valley margins with scattered oaks and river bottomlands or marshes next to deciduous woodland. Open grasslands, meadows, or marshes for foraging close to isolated, dense-topped trees for nesting and perching.	Known to occur within the Project area. Suitable wetland and grassland habitat exists within the Project area. Observed within the Project area in February, 2008.
<i>Haliaeetus leucocephalus</i>	Bald eagle	FD/CE/FP	Ocean shore, lake margins, and rivers for both nesting and wintering. Most nests within 1 mile of water. Nests in large, old-growth, or dominant live tree with open branches, especially ponderosa pine. Roosts communally in winter.	May potentially occur as a migrant or winter resident. Suitable wetland habitat exists in the Project area.
<i>Circus cyaneus</i>	Northern harrier	SC	Coastal salt and fresh-water marsh. Nest and forage in grasslands, from salt grass in desert sink to mountain cienagas. Nests on ground in shrubby vegetation, usually at marsh edge; nest built of a large mound of sticks in wet areas.	Known to occur within the Project area. Suitable wetland and grassland habitat exists within the Project area. Observed within the Project area in February, 2008.
<i>Buteo swainsoni</i>	Swainson's hawk	CT	Breeds in grasslands with scattered trees, juniper-sage flats, riparian areas, savannahs, and agricultural or ranch. Requires adjacent suitable foraging areas such as grasslands, or alfalfa or grain fields supporting rodent populations.	Known to occur within the Project area. Suitable grassland and agricultural habitats exist within the Project area.
<i>Buteo regalis</i>	Ferruginous hawk	formerly SC	Open grasslands, sagebrush flats, desert scrub, low foothills and fringes of pinyon-juniper habitats. Eats mostly lagomorphs, ground squirrels, and mice. Population trends may follow lagomorph population cycles.	An SC species until February, 2008; currently not a special status species. Not discussed further.
<i>Aquila chrysaetos</i>	Golden eagle	FP	Rolling foothills, mountain areas, sage-juniper flats, and desert. Cliff-walled canyons provide nesting habitat in most parts of range; also, large trees in open areas.	May potentially occur as a migrant or winter resident. Suitable grassland, wetland and agricultural habitat exists within the Project area.
<i>Falco peregrinus anatum</i>	American peregrine falcon	FD/CE/FP	Near wetlands, lakes, rivers, or other water; on cliffs, banks, dunes, mounds; also, human-made structures. Nest consists of a scrape on a depression or ledge in an open site.	Known to occur within the Project area. Suitable wetland habitat exists within the Project area. Observed within the Project area in February, 2008.

Appendix B.2

Table B.2-2. Special Status Animal Species Identified During the Literature Search

Scientific Name	Common Name	Status	Habitat Conditions	Potential To Occur in Project Area
<i>Grus canadensis tabida</i>	Greater sandhill crane	CT/FP	Nests in wetland habitats in northeastern California; winters in the Central Valley. Prefers grain fields within 4 mi. of a shallow body of water used as a communal roost site. Similar winter habitat to lesser sandhill crane.	Known to occur in the Project vicinity. Suitable grassland, agricultural and wetland habitats exist within the Project area.
<i>Grus canadensis canadensis</i>	Lesser sandhill crane	SC	Winters in the central valley and southern California. Frequents annual and perennial grassland habitats, moist croplands with rice or corn stubble, and open, emergent wetlands. Prefers treeless plains.	May potentially occur. Suitable grassland, agricultural and wetland habitats exist within the Project area.
<i>Charadrius montanus</i>	Mountain plover	SC	Short grasslands, freshly plowed fields, newly sprouting grain fields, and sometimes sod farm short vegetation, bare ground and flat topography. Prefers grazed areas and areas with burrowing rodents.	Known to occur within the Project area. Suitable grassland and agricultural habitats exist within the Project area.
<i>Numenius americanus</i>	Long-billed curlew	formerly SC	Breeds in upland shortgrass prairies and wet meadows in northeastern California. Habitats on gravelly soils and gently rolling terrain are favored over others.	An SC species until February, 2008; currently not a special status species. Not discussed further.
<i>Chlidonias niger</i>	Black tern	SC	Breeds in the Central Valley and northeastern California. Breeds and forages in fresh emergent wetlands, lakes, ponds and rice fields.	Known to occur within the Project area. Suitable wetland habitat and rice fields exist within the Project area and vicinity.
<i>Coccyzus americanus occidentalis</i>	Western yellow-billed cuckoo	FC/CE	Riparian forest nester, along the broad, lower flood-bottoms of larger river systems. Nests in riparian jungles of willow, often mixed with cottonwoods, with lower story of blackberry, nettles, or wild grape.	Unlikely to occur. Largely extirpated from the Central Valley, lack of suitable mature riparian habitat in the Project area. Some historic records at Mendota Pool, in the Project vicinity.
<i>Athene cunicularia</i>	Western burrowing owl	SC	Open, dry annual or perennial grasslands, deserts and scrublands characterized by low-growing vegetation. Subterranean nester, dependent upon burrowing mammals, most notably, the California ground squirrel.	Known to occur within the Project vicinity. Suitable grassland and agricultural habitats exist within the Project area.
<i>Asio otus</i>	Long-eared owl	SC	Year-round, typically uses dense groves of trees for roosting and nesting adjacent to open habitats such as grasslands, shrublands and deserts for foraging. Will use densely forested areas for breeding.	May potentially occur as a migrant or winter resident. Suitable open habitats and dense groves of trees exist within the Project area.

Appendix B.2

Table B.2-2. Special Status Animal Species Identified During the Literature Search

Scientific Name	Common Name	Status	Habitat Conditions	Potential To Occur in Project Area
<i>Asio flammeus</i>	Short-eared owl	SC	Found in annual and perennial grasslands, meadows, agricultural areas and wetlands. Nests on ground amongst concealed vegetation.	Known to occur within the Project area. Suitable wetland and grassland habitats exist within the Project area. Observed on an alternative pipeline route in February, 2008.
<i>Empidonax traillii brewsteri</i>	Little willow flycatcher	CE	Mountain meadows and riparian habitats in the Sierra Nevada and cascades. Nests near the edges of vegetation clumps and near streams. Formerly a widespread breeder in riparian lowlands of California. Widespread migrant in riparian and other wooded area in lowlands.	May potentially occur as a migrant in riparian vegetation. Extirpated from much of lowland California as a breeder.
<i>Lanius ludovicianus</i>	Loggerhead shrike	SC	Found in lowlands and foothills in open habitats with scattered shrubs, trees, posts, fences, utility lines or other perches. These include open woodlands, riparian areas wetlands, grasslands, rangelands and other agricultural areas. Nests in dense foliage of trees and shrubs.	Known to occur. Suitable open habitats exist within the Project area. Observed within the Project area in February, 2008.
<i>Vireo bellii pusillus</i>	Least Bell's vireo	FE/CE	Currently breeds in riparian areas from Santa Barbara County south to Baja California, west into Riverside and San Bernardino Counties. Winters in Baja California. Formerly abundant in riparian areas in Central and Southern California.	Unlikely to occur. Now completely extirpated from the Sacramento-San Joaquin Valleys, although some suitable riparian habitat is present in the Project area.
<i>Riparia riparia</i>	Bank swallow	CT	Colonial nester; nests primarily in riparian and other lowland habitats west of the desert requires vertical banks/cliffs with fine-textured/sandy soils near streams, rivers, lakes, ocean to dig nesting hole.	Known to occur in the Project vicinity. Suitable riparian and wetland habitat exists within the Project area.
<i>Toxostoma lecontei</i>	Le Conte's thrasher	SC	Desert resident; primarily of open desert wash, desert scrub, alkali desert scrub, and desert succulent scrub habitats. Commonly nests in a dense, spiny shrub or densely branched cactus in desert wash habitat, usually 2-8 feet above ground.	No potential to occur, range is outside of Project area. Not discussed further.
<i>Dendroica petechia brewsteri</i>	Yellow warbler	SC	Breeds in wet, deciduous thickets, especially riparian areas dominated by willows, and in disturbed and early successional habitats. Occurs as a migrant in a variety of wooded habitats throughout California, particularly in riparian areas.	May potentially occur as a migrant. Unlikely to occur as a breeder. Suitable riparian habitats exist within the Project area.

Appendix B.2

Table B.2-2. Special Status Animal Species Identified During the Literature Search

Scientific Name	Common Name	Status	Habitat Conditions	Potential To Occur in Project Area
<i>Icteria virens</i>	Yellow-breasted chat	SC	Breeds in riparian areas and shrubby habitats, mostly riparian in California. Similar habitats are used in migration.	May potentially occur as a migrant. Unlikely to occur as a breeder. Suitable riparian habitats exist within the Project area.
<i>Pooecetes gramineus affinis</i>	Oregon vesper sparrow	SC	Winters in the Central Valley south to Baja California. Found in grasslands, preferring dry, open areas with short, sparse grass or herbaceous cover. This subspecies may not be identifiable in the field.	May potentially occur. Suitable grassland and agricultural habitats exist within the Project area.
<i>Agelaius tricolor</i>	Tricolored blackbird	SC	Highly colonial species, most numerous in central valley and vicinity. Largely endemic to California. Requires open water, protected nesting substrate, and foraging area with insect prey within a few km of the colony.	Known to occur in the Project vicinity. Suitable wetland and agricultural habitats exist within the Project area.
<i>Xanthocephalus xanthocephalus</i>	Yellow-headed blackbird	SC	Nests in fresh emergent wetland with dense vegetation in deep water, often along borders of lakes or ponds. Forages in emergent wetland and moist, open areas, especially cropland and muddy shores of lacustrine habitat.	Known to occur in the Project vicinity. Suitable wetland and agricultural habitats exist within the Project area.
<i>Lasiurus cinereus</i>	Hoary bat	formerly SC	Prefers open habitats or habitat mosaics, with access to trees for cover and open areas or habitat edges for feeding. Roosts in dense foliage of medium to large trees. Feeds primarily on moths. Requires water.	An SC species until February, 2008; currently not a special status species. Not discussed further.
<i>Lasiurus blossevillii</i>	Western red bat	SC	Roosts primarily in trees, 2 to 40 feet above ground, from sea level up through mixed conifer forests prefers habitat edges and mosaics with trees that are protected from above and open below with open areas for foraging.	Known to occur within the Project vicinity. Suitable woodland and open habitats exists within the Project vicinity.
<i>Eumops perotis californicus</i>	Western mastiff bat	SC	Many open, semi-arid to arid habitats, including conifer and deciduous woodlands, coastal scrub, grasslands, chaparral, etc. Roosts in crevices in cliff faces, high buildings, trees and tunnels.	Known to occur within the Project vicinity. Suitable roosting sites and foraging habitat exists within the Project area.

Appendix B.2

Table B.2-2. Special Status Animal Species Identified During the Literature Search

Scientific Name	Common Name	Status	Habitat Conditions	Potential To Occur in Project Area
<i>Corynorhinus townsendii</i>	Townsend's big-eared bat	SC	Forages over a broad variety of habitats in California, particularly mesic areas. Requires, caves, tunnels, mines, buildings or other manmade structures for roosting. Highly sensitive to disturbance at roost sites.	May potentially occur. Suitable roosting sites and foraging habitat exists within the Project area.
<i>Neotoma fuscipes riparia</i>	Riparian (=San Joaquin Valley) woodrat	FE/SC	Riparian areas along the San Joaquin, Stanislaus and Tuolumne Rivers. Needs areas with mix of brush and trees. Need suitable nesting sites in trees, snags or logs.	No potential to occur, range is outside of Project area. Not discussed further.
<i>Onychomys torridus tularensis</i>	Tulare grasshopper mouse	SC	Hot, arid valleys and scrub deserts in the southern San Joaquin Valley. Diet almost exclusively composed of arthropods, therefore needs abundant supply of insects.	Known to occur within the Project vicinity. Suitable grassland and scrub habitats exist within the Project area.
<i>Dipodomys ingens</i>	Giant kangaroo rat	FE/CE	Annual grasslands on the western side of the San Joaquin Valley, marginal habitat in alkali scrub. Need level terrain and sandy loam soils for burrowing.	May potentially occur. Suitable grassland and scrub habitats exist within the Project area.
<i>Dipodomys nitratoides brevinasus</i>	Short-nosed kangaroo rat	SC	Western side of San Joaquin Valley in grassland and desert shrub associations, especially Atriplex. Occurs in highly alkaline soils around soda lake. Needs friable soils. Favors flat to gently sloping terrain.	May potentially occur. Suitable grassland and shrub habitats exist within the Project area.
<i>Dipodomys nitratoides exilis</i>	Fresno kangaroo rat	FE/CE	Alkali sink-open grassland habitats in western Fresno County. Bare alkaline clay-based soils subject to seasonal inundation, with more friable soil mounds around shrubs and grasses.	Historically known to occur in the Project vicinity. However last known occurrence was in 1992, and it is unknown if this subspecies is still extant.
<i>Dipodomys nitratoides nitratoides</i>	Tipton kangaroo rat	FE/CE	Saltbrush scrub and sink scrub communities in the Tulare Lake Basin of the southern San Joaquin Valley. Needs soft friable soils which escape seasonal flooding. Digs burrows in elevated soil mounds at bases of shrubs.	No potential to occur, range is outside of Project area. Not discussed further.
<i>Ammospermophilus nelsoni</i>	Nelson's antelope squirrel	CT	Western San Joaquin Valley from 200-1200 feet. Elevation on dry, sparsely vegetated loam soils. Digs burrows or use kangaroo rat burrows. Need widely scattered shrubs, forbs and grasses in broken terrain with gullies and washes	Known to occur within the Project vicinity. Suitable grassy areas with sparse shrubs are present in the Project area.

Appendix B.2

Table B.2-2. Special Status Animal Species Identified During the Literature Search

Scientific Name	Common Name	Status	Habitat Conditions	Potential To Occur in Project Area
<i>Vulpes macrotis mutica</i>	San Joaquin kit fox	FE/CT	Annual grasslands or grassy open stages with scattered shrubby vegetation. Need loose-textured sandy soils for burrowing, and suitable prey base.	Known to occur in the Project vicinity. Suitable grassland and shrubby habitats exist within the Project area.
<i>Taxidea taxus</i>	American badger	SC	Most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils. Need sufficient food, friable soils and open, uncultivated ground. Prey on burrowing rodents. Dig burrows.	Known to occur within the Project vicinity. Suitable uncultivated, open habitats exist within the Project area.

Notes:

The Project vicinity encompasses a 5-mile radius around the Project area. The Project area encompasses a 0.5-mile radius around the Project footprint. The Project footprint includes all current proposed gas transmission routes and their alternatives where construction may directly affect the existing environment. Species found in the Project area or Project vicinity may not be present within the Project footprint.

Sources:

CDFG 2008a, CDFG 2008b, CDFG 2005a, USDI 2002, USFWS 1998, CalTrans 2004

Status Codes:

- FE - Federally Endangered
- FT - Federally Threatened
- CE - State of California Endangered
- CT - State of California Threatened
- FC - Federal Candidate
- FD - Federal Delisted
- SC - Species of Special Concern
- FP - California Fully Protected Species

Appendix B.2

Table B.2-3. Incidental Wildlife Observations within the Project Area, Alternatives and Project Vicinity

Common Name	Scientific Name	Observation Date				Notes
		Feb 19-20, 2008 ¹	Apr 2, 2008 ²	Apr 16-17, 2008 ³	Apr 15-18, 2008 ⁴	
<i>Reptiles</i>						
Tiger Whiptail	<i>Aspidoscelis tigris</i>	x				Probable tracks observed on north levee of San Joaquin River
Garter Snake	<i>Thamnophis</i> sp				x	Species not identified, observed in an agricultural drain in the Gill Ranch Gas Field
<i>Birds</i>						
Snow/Ross's Goose	<i>Chen caerulescens</i> or <i>C. rossii</i>	x				Several individuals that belonged to either or both species were observed from a distance inside the Mendota Wildlife Area
Cackling Goose	<i>Branta hutchinsii</i>	x				Several hundred were observed inside the Mendota Wildlife Area
Gadwall	<i>Anas strepera</i>		x			Mendota Wildlife Area
American Wigeon	<i>Anas americana</i>	x				
Mallard	<i>Anas platyrhynchos</i>	x	x	x	x	
Northern Shoveler	<i>Anas clypeata</i>	x				
Northern Pintail	<i>Anas acuta</i>	x				
Green-winged Teal	<i>Anas crecca</i>	x				
Canvasback	<i>Aythya valisineria</i>	x				
Ring-necked Duck	<i>Aythya collaris</i>	x	x			Mendota Wildlife Area
Bufflehead	<i>Bucephala albeola</i>	x				
Ruddy Duck	<i>Oxyura jamaicensis</i>	x		x	x	Four-Mile Slough
California Quail	<i>Callipepla californica</i>		x			Mendota Wildlife Area
Pied-billed Grebe	<i>Podilymbus podiceps</i>	x	x		x	Mendota Wildlife Area on 4/2
Western Grebe	<i>Aechmophorus occidentalis</i>		x			Mendota Wildlife Area

Appendix B.2

Table B.2-3. Incidental Wildlife Observations within the Project Area, Alternatives and Project Vicinity

Common Name	Scientific Name	Observation Date				Notes
		Feb 19-20, 2008 ¹	Apr 2, 2008 ²	Apr 16-17, 2008 ³	Apr 15-18, 2008 ⁴	
Clark's Grebe	<i>Aechmophorus clarkii</i>	x				
American White Pelican	<i>Pelecanus erythrorhynchos</i>	x	x		x	Circling over Mendota Pool area on 4/2
Double-crested Cormorant	<i>Phalacrocorax auritus</i>	x	x			Common in and adjacent to the Mendota Wildlife Area
American Bittern	<i>Botaurus lentiginosus</i>		x			Mendota Wildlife Area
Great Blue Heron	<i>Ardea herodias</i>	x	x	x	x	
Great Egret	<i>Ardea alba</i>	x	x	x	x	
Snowy Egret	<i>Egretta thula</i>		x		x	Mendota Wildlife Area
Black-crowned Night Heron	<i>Nycticorax nycticorax</i>	x				
White-faced Ibis	<i>Plegadis chihi</i>	x	x	x	x	Several in the Mendota Wildlife Area
White-tailed Kite	<i>Elanus leucurus</i>	x				Several in the Mendota Wildlife Area, Alkali Sink Ecological Preserve and other adjacent areas
Northern Harrier	<i>Circus cyaneus</i>	x	x	x	x	Common in the project area
Cooper's Hawk	<i>Accipiter cooperii</i>	x				One in Panoche Creek where it is crossed by California Ave. on 2/19
Swainson's Hawk	<i>Buteo swainsoni</i>		x	x		Pair copulating in tree at SW corner of Fairfax Ave./McKinley
Red-tailed Hawk	<i>Buteo jamaicensis</i>	x		x	x	04/16-17, active nests observed-adults incubating
American Kestrel	<i>Falco sparverius</i>	x				
Peregrine Falcon	<i>Falco peregrinus</i>	x				One adult on Jefferson Ave.G9, just southwest of the Mendota Wildlife Area on 2/19
Common Moorhen	<i>Gallinula chloropus</i>	x		x		Four-Mile Slough
American Coot	<i>Fulica americana</i>	x	x	x	x	Mendota Wildlife Area, Four-mile Slough
Sandhill Crane	<i>Grus canadensis</i>	x				Observed flying over the Mendota Wildlife Area, standing in fields east of the Project Area along Hwy 180
Killdeer	<i>Charadrius vociferus</i>	x		x	x	
Black-necked Stilt	<i>Himantopus mexicanus</i>	x	x			Mendota Wildlife Area
Greater Yellowlegs	<i>Tringa melanoleuca</i>	x			x	

Appendix B.2

Table B.2-3. Incidental Wildlife Observations within the Project Area, Alternatives and Project Vicinity

Common Name	Scientific Name	Observation Date				Notes
		Feb 19-20, 2008 ¹	Apr 2, 2008 ²	Apr 16-17, 2008 ³	Apr 15-18, 2008 ⁴	
Long-billed Curlew	<i>Numenius americanus</i>	x				30+ feeding in a field along Jefferson Ave. south of the Mendota Wildlife Area
Least Sandpiper	<i>Calidris minutilla</i>	x				
Ring-billed Gull	<i>Larus delawarensis</i>	x				
Herring Gull	<i>Larus argentatus</i>	x				
Eurasian Collared-Dove	<i>Streptopelia decaocto</i>	x	x			Non-native species
Rock Pigeon	<i>Columba livia</i>	x	x	x		Non-native species
Mourning Dove	<i>Zenaida macroura</i>	x	x	x	x	
Great Horned Owl	<i>Bubo virginianus</i>	x	x	x	x	Adult in nest near Chowchilla Bypass on 4/2
Short-eared Owl	<i>Asio flammeus</i>			x		W. Lincoln Ave./Ohio Ave. intersection. Flushed from grass and flew about 200 m before landing
Northern Flicker	<i>Colaptes auratus</i>	x				
Black Phoebe	<i>Sayornis nigricans</i>	x	x	x	x	
Say's Phoebe	<i>Sayornis saya</i>	x				
Western Kingbird	<i>Tyrannus verticalis</i>		x	x	x	On 4/17 - observed building nest on PG&E T-line transformer
Loggerhead Shrike	<i>Lanius ludovicianus</i>	x		x	x	Several in the Mendota Wildlife Area and the Alkali Sink Ecological Area. Observed on 4/17 on north end of Frussetta property
Western Scrub-Jay	<i>Aphelocoma californica</i>	x			x	
Yellow-billed Magpie	<i>Pica nuttalli</i>	x				
American Crow	<i>Corvus brachyrhynchos</i>	x	x	x	x	
Common Raven	<i>Corvus corax</i>	x				
Horned Lark	<i>Eremophila alpestris</i>	x			x	Common throughout the Project area
Tree Swallow	<i>Tachycineta bicolor</i>	x				
Cliff Swallow	<i>Petrochelidon pyrrhonota</i>	x	x	x	x	

Appendix B.2

Table B.2-3. Incidental Wildlife Observations within the Project Area, Alternatives and Project Vicinity

Common Name	Scientific Name	Observation Date				Notes
		Feb 19-20, 2008 ¹	Apr 2, 2008 ²	Apr 16-17, 2008 ³	Apr 15-18, 2008 ⁴	
Barn Swallow	<i>Hirundo rustica</i>			X	X	
Bewick's Wren	<i>Thryomanes bewickii</i>	X				
House Wren	<i>Troglodytes aedon</i>	X				
Ruby-crowned Kinglet	<i>Regulus calendula</i>	X				
American Robin	<i>Turdus migratorius</i>	X		X	X	
Northern Mockingbird	<i>Mimus polyglottos</i>	X	X	X	X	
European Starling	<i>Sturnus vulgaris</i>	X		X	X	Non-native species
American Pipit	<i>Anthus rubescens</i>	X				
Yellow-rumped Warbler	<i>Dendroica coronata</i>	X			X	
Common Yellowthroat	<i>Geothlypis trichas</i>	X			X	
Savannah Sparrow	<i>Passerculus sandwichensis</i>	X				
Song Sparrow	<i>Melospiza melodia</i>	X	X		X	
Lincoln's Sparrow	<i>Melospiza lincolnii</i>	X		X		
White-crowned Sparrow	<i>Zonotrichia leucophrys</i>	X	X	X	X	
Golden-crowned Sparrow	<i>Zonotrichia atricapilla</i>	X				
Dark-eyed Junco	<i>Junco hyemalis</i>	X			X	
Red-winged Blackbird	<i>Agelaius phoeniceus</i>	X	X	X	X	
Western Meadowlark	<i>Sturnella neglecta</i>	X	X	X	X	
Brewer's Blackbird	<i>Euphagus cyanocephalus</i>	X	X	X	X	
Great-tailed Grackle	<i>Quiscalus mexicanus</i>	X	X			Hwy 180 and Fresno Slough
Bullock's Oriole	<i>Icterus bullockii</i>			X	X	
House Finch	<i>Carpodacus mexicanus</i>	X			X	
American Goldfinch	<i>Carduelis tristis</i>	X				
House Sparrow	<i>Passer domesticus</i>	X	X	X	X	Non-native species

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Table B.2-3. Incidental Wildlife Observations within the Project Area, Alternatives and Project Vicinity

Common Name	Scientific Name	Observation Date				Notes
		Feb 19-20, 2008 ¹	Apr 2, 2008 ²	Apr 16-17, 2008 ³	Apr 15-18, 2008 ⁴	
Black Chinned Hummingbird	<i>Archilochus alexandri</i>					
Yellow Warbler	<i>Dendroica petechia</i>				X	
Mammals						
California Ground Squirrel	<i>Spermophilus beecheyi</i>	X	X		X	
Black-tailed Jackrabbit	<i>Lepus californicus</i>	X	X			
Coyote	<i>Canis latrans</i>	X				

Notes: ¹ ENTRIX biologists Tucker and Colgate, ² ENTRIX biologist Williams, ³ ENTRIX biologist Williams, ⁴ ENTRIX biologists Mulder and Colgate